NETWORK WORLD
The Newsweekly of Enterprise Network Strategies
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New Column
Ed Krol on the Internet
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Fast Ethernet backers woo vendor allies

By Joanne Cummings
and Skip MacAskill
Network World Staff

SANTA CLARA, Calif. — If you're confused about who's supporting the two main proposals for 100M bit/sec Ethernet, join the club. Even proponents of the plans can't seem to keep that straight.

The two rival camps — one led by Hewlett-Packard Co. and AT&T Microelectronics, and the other by 3Com Corp. and SynOptics Communications, Inc. — have been frantically lining up backers for their proposals prior to this week's IEEE 802.3 committee meeting. The 802.3 group is considering a standard for a higher speed version of the venerable local-area network technology.

According to sources, 3Com held closed-door meetings with some key players — including Cabletron Systems, Inc., Chipcom Corp., David Systems, Inc., Intel Corp., Kalpana, Inc. and National Semiconductor Corp. — to sell them on its joint proposal with SynOptics. At press time,

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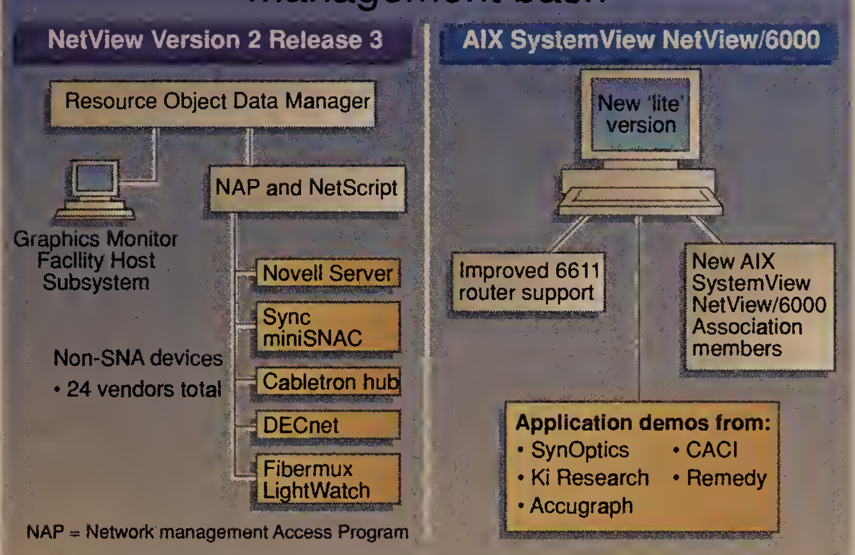
IBM to host ComNet multivendor management bash


NetView Version 2 Release 3
Resource Object Data Manager
Graphics Monitor Facility Host Subsystem
NAP and NetScript
Non-SNA devices
• 24 vendors total
Novell Server
Sync miniSNAC
Cabletron hub
DECnet
Fibermux LightWatch
NAP = Network management Access Program
AIX SystemView NetView/6000
New 'lite' version
Improved 6611 router support
New AIX SystemView NetView/6000 Association members
Application demos from:
• SynOptics
• CACI
• Ki Research
• Remedy
• Accugraph

IBM will be joined by 2 dozen vendors at next week's ComNet '93 show in Washington, D.C. to announce and demonstrate an array of multivendor management tools for NetView and its AIX-based SNMP management system.

GRAPHIC BY SUSAN J. CHAMPENY

T-1 vendors jockeying for position as ATM emerges

By Jim Duffy
Senior Editor

With Asynchronous Transfer Mode on the horizon, the leading T-1 multiplexer vendors are outlining migration strategies for customers hoping to maintain their investment in time-division multiplexer (TDM) T-1 gear.

Of the leading T-1 vendors, Newbridge Networks, Inc. and StrataCom, Inc. may be in the best position to migrate their installed bases to ATM, analysts said. But they are waiting to see products from Ascom Timeplex, Inc. and General DataComm, Inc. (GDC) before making final judgments.

Although the company has all the piece parts, Network Equipment Technologies, Inc.'s (NET) scheme remains shrouded in

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IBM plots net mgmt. rollout for ComNet

NetView/6000 Lite, new NetView multivendor net management tools on tap from IBM and friends.

By Michael Cooney
Senior Editor

WASHINGTON, D.C. — IBM will be joined by a host of partners next week in announcing a new version of its AIX SystemView NetView/6000 product along with tools that promise to enhance NetView's multivendor management capabilities.

The enhancements, which will be announced at the ComNet '93 show here, include a scaled-down version of NetView/6000, improved management features for the 6611 Network Processor router and third-party products that make it easier to build applications for managing non-Systems Network Architecture devices from NetView.

The company will also demonstrate for the first time the SNA and non-SNA management capabilities of its OS/2-based Graphics Monitor Facility Host Subsystem (GMFHS). Available in May, GMFHS will let NetView Version 2 Release 3 users display and control SNA and non-SNA devices from one graphical net management screen. IBM executives last week gave *Network World* an exclusive firsthand look at the product and the rest of the management demo planned for its ComNet booth.

The new AIX SystemView NetView/6000 Lite will be a less feature-filled and less expensive version of IBM's AIX- and Simple Network Management Protocol-based platform for managing Transmission Control Protocol/

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The facts on fax servers show transmission features hold the key to selecting the right one for the job. Page 32.

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NETLINE

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USERS PLAN SMDS RALLY at interest group meeting where frame relay access spec will emerge. Page 4.

PENRIL TO USE COMNET to roll out slew of datacom equipment. Page 4.

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MCI users express concern over access pricing change

By Bob Wallace
Senior Editor

Some MCI Communications Corp. customers are finding out the hard way that they won't get big savings from MCI's recently announced Access Pricing Plan.

That plan promises savings of up to 20% on dedicated local access links for new and existing customers that sign long-term service contracts. But MCI also changed the way it charges for dedicated access — a change that for some companies will offset any savings.

MCI moved from distance-sensitive access pricing to fixed fees. This will save money for users with sites located far away from access points, but for others, it will lead to price hikes that may be offset only if they agree to sign the maximum three-year discount agreement under the Access Pricing Plan.

NETWORK WORLD'S
R.A.F.
READER ADVOCACY FORCE

The problem was brought to light by a network manager at a major Midwest utility who called *Network World's* Reader Advocacy Force hot line. (To call the hot line, dial (800) 622-1108, Ext. 487, or use the Internet at nwraf@world.std.com.)

"For us, it's a [tough] situa-

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Infonet joins Microsoft in LAN mgmt.

By John Dix and
Fredric Paul
Network World Staff

Infonet Services Corp. and Microsoft Corp. will announce a development relationship tomorrow under which the companies will use Microsoft Windows NT technology to extend the management capabilities of Infonet's LAN internet service.

In related news, Infonet announced last week that it will offer an end-to-end data encryption option for its InfoLAN service, which is a worldwide router-based Transmission Control Protocol/Internet Protocol network.

Infonet declined to comment on the Microsoft relationship, but according to sources briefed by the companies, fruits of the codevelopment effort — which will

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Chipcom lays out its 1993 internetworking blueprint

Vendor planning to add Ethernet switching and ATM backplane functions to its intelligent hub line.

By Skip MacAskill
Staff Writer

SOUTHBOROUGH, Mass. — Chipcom Corp. this week is expected to announce its future technology direction, which will include the integration of Ethernet switching and ATM backplane capabilities into its intelligent hub line by the end of the year.

David Fowler, the company's vice president of marketing, said Chipcom also plans to integrate more bridge/routing functions into the hub and enhance the automatic reconfiguration features of its net management package.

"End users are tired of being responsible for piecing together the network," he said. "They want to look at what they can do to solve their business problems with the net."

The company will team with an unnamed partner to introduce Ethernet switching capabilities for its ONline System Concentrator intelligent hub line to provide users with dedicated Ethernet links on a per-port basis.

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IBM preps to unveil 32-bit version of its OS/2 DBMS

New Database Manager to work better with DB2.

By Joanne Cummings and Timothy O'Brien
Network World Staff

SAN JOSE, Calif. — IBM is expected to announce at the Client/Server '93 show here this week a 32-bit version of its OS/2 Database Manager that promises improved performance and enhanced compatibility with IBM's DB2 relational database management system.

According to sources, the new OS/2 DBMS — which may be dubbed DB2 for OS/2 — will support the remote unit of work (RUOW) capability with DB2, which will enable it to extract and update information from a remote DB2 DBMS.

This falls short of distributed RUOW capability, which would enable users to extract and update data from multiple DB2 databases at once. Sources close to the company said that distributed RUOW capability is coming, although they declined to say when.

In addition to the OS2 Database Manager announcement, IBM is expected to offer an enhanced version of Distributed

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Retix products centralize management of E-mail nets

By Bob Brown
Senior Editor

SANTA MONICA, Calif. — Retix last week introduced a new software product suite designed to ease directory synchronization across heterogeneous electronic mail systems and allow for centralized E-mail net management.

Retix's new OpenMessaging Solution products include the OpenServer Directory Exchange Server (DXS) and OpenServer Remote Manager, as well as complementary enhancements to Retix's existing X.400-based gateways and message routers.

Synchronization is achieved by adding Directory Exchange Agent (DXA) software to Retix X.400 gateways and creating a central synchronization server by loading OpenServer DXS software onto an Intel Corp. 80386-based personal computer. OpenServer DXS runs above Unix versions from either Interactive or The Santa Cruz Operation, Inc.

Crawford

The process begins with DXA-based X.400 gateways copying E-mail directories of attached systems, said James Neiser, associate vice president of marketing for Retix's Open Systems Inter-

(continued on page 9)

Briefs

A matter of semantics. IBM will demonstrate at next week's ComNet '93 show products conforming to its Multiprotocol Transport Network (MPTN) specifications. MPTN, part of the Common Transport Semantics layer of the IBM Networking Blueprint announced last March, enables applications to use any underlying transport protocols. Sources said IBM is working feverishly to line up third-party developers for the announcement. IBM has declined to identify any, but Ki Research, Inc. and at least one other company are known to be working on MPTN applications.

In the same vein, IBM later this quarter will announce a Transmission Control Protocol/Internet Protocol Sockets application, known as SNAckets, that works with Systems Network Architecture nets and a Common Program Interface-Communication application that can run over TCP/IP.

Get moving. Systems Center, Inc. of Reston, Va., today will announce new Transmission Control Protocol/Internet Protocol file-transfer software. Network DataMover for Unix will let users exchange files among IBM MVS mainframes that support TCP/IP and Unix systems from Digital Equipment Corp., Hewlett-Packard Co., IBM, NCR Corp. and Sun Microsystems, Inc. It also supports automated, unattended file transfers. Available March 31, server implementations will cost between $1,500 and $18,000 and clients will cost between $375 and $4,500.

A magical time. Start-up General Magic, Inc. is expected to announce wireless messaging software for hand-held and portable computers on Feb. 8 in New York. A joint venture between Apple Computer, Inc., Sony Corp. and Motorola, Inc., the firm's Telescript software offers a robust graphical user interface and supports one-way messaging. It can be used with any portable computer, including Apple's Newton personal digital assistant.

Taking wing. Madison, Wis.-based Wingra Technologies, Inc. last week announced a low-cost, software-based message switch, called New Missive, that runs on Digital Equipment Corp. VAXes and translates messages among Lotus Development Corp. cc:Mail and Novell, Inc. Message Handling System-compliant electronic mail systems, IBM's OfficeVision for VM and the Application System/400, Unix mail systems based on the Simple Mail Transfer Protocol and all DEC E-mail formats. The switch costs $7,500.

MacLean out . . . Audrey MacLean, cofounder and chief executive officer of Adaptive Corp., has relinquished her post in a move the company said was intended to speed the merger of Adaptive with its parent, Network Equipment Technologies, Inc. (NET). MacLean has assumed the newly created position of Adaptive chairman, while Steve Markman, NET senior vice president and general manager, has been named acting CEO.

According to NET CEO Dan Warmenhoven, MacLean is not likely to manage Adaptive operations after the merger.

. . . Walker in. DEC has recently named Laurence Walker vice president of Networks Engineering, a newly formed business unit. Walker will oversee development and marketing of Advantage Networks, Pathworks and Polycenter network software, as well as DEC's bridging, routing and local-area network hub hardware.

CONTACTS

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Sequent to unveil Windows NT-based superserver line

Firm also signs development deal with Tricord.

By Caryn Gillooly
Senior Editor

BEAVERTON, Ore. — Sequent Computer Systems, Inc. last week announced its intention to bring out a broad new line of superservers to run Microsoft Corp.'s Windows NT operating system.

In conjunction with the announcement of the WinServer line, Sequent also revealed an agreement with Tricord Systems, Inc. to jointly develop the lower end of the line, with Sequent owning exclusive marketing rights.

The company declined to provide details on the new server line other than to say it will include a range of symmetric processing systems, from single-processor machines up to those supporting as many as 30 processors. That will give Sequent at least a new low-end machine since its existing Symmetric 200 line, based on the Intel Corp. 486 chip, scales from two to 30 processors, said Scott Winkler, director of systems marketing at Sequent, based here.

All machines in the WinServer line will ship with Windows NT installed and will be available in May, about the time Windows NT is expected to be available.

Sequent's current offerings are considered more high end than superservers from companies such as Tricord. The company is hoping the combination of the Windows NT support and help from Tricord will help the WinServers break into mainstream computing markets.

"We talked to hundreds of large companies, and a substantial number say NT will play a large part in their future networking plans," Winkler said. "People have committed to Windows as a corporate standard, and they're looking for a compatible server environment."

The company looked at OS/2, Sun Microsystems, Inc.'s Solaris and Hewlett-Packard Co.'s OpenDesktop, "but nothing had the market demand potential NT had," he said. "We won't support the other operating systems as servers."

Sequent is hoping Tricord's experience in selling superservers to mainstream user sites and Tricord's knowledge of Extended Industry Standard Architecture-type machines will further its cause.

SMDS Interest Group wins vital user backing

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — In the strongest show of user support to date, more than 60 current and prospective Switched Multimegabit Data Service customers are expected to attend the SMDS Interest Group at the ComNet '93 conference here next week.

In what SMDSIG officials are calling a watershed event in the evolution of SMDS, user members of the nascent SMDS Users Group and the Federal Broadband Users Group are expected to detail their networking needs with the interest group, which is largely made up of equipment vendors and carriers. The SMDSIG is also expected to finalize a specification that delineates how firms can use low-speed frame relay service to access SMDS. Analysts say this move will bring the service, which today uses 1.544M bit/sec access, to the masses.

Robyn Aber, an SMDSIG member from Bell Communications Research, a research firm owned by the seven regional Bell holding companies, looks forward to increased user participation.

"Mass user participation in the development of SMDS products and services is absolutely critical to the future of the industry," she said.

Bill Horst, a computer specialist with the General Services Administration, said government agencies "want to establish a dialogue with SMDSIG to find out from carriers when they plan to offer SMDS, what it will likely cost and which vendors are making products that will work with it. But most of all, we want to make sure the industry knows there are a large number of users contemplating high-bandwidth applications that could use SMDS at some point," he said.

Horst, the first paying SMDS customer, recently founded the Federal Broadband Users Group. Its members include the Department of Transportation, the Federal Bureau of Investigation and the Drug Enforcement Agency.

The SMDS Users Group was founded last fall by Rockwell In-

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Vendors rallying around high-speed modem scheme

But some worry V.32terbo will create confusion.

By Bob Brown
Senior Editor

A group of 18 vendors this week will endorse a new high-speed modem modulation scheme designed to meet the needs of users who cannot wait for modems based on the forthcoming CCITT V.fast standard.

The catch is that the proposed V.32terbo scheme was recently rejected by the Consultative Committee on International Telephony and Telegraphy, relegating it to the status of a de facto standard at best.

Some vendors objected to making V.32terbo a CCITT standard because it could create market confusion and delay work already well under way on the V.fast standard, which will likely be called V.34.

Backers of V.32terbo said some vendors have rejected it because they have already come out with proprietary products designed to hold the line until V.fast arrives.

The proposed V.32terbo modem modulation scheme will support data rates of 19.2K and 16.8K bit/sec, placing it in between the CCITT V.32bis rate of 14.4K bit/sec and the anticipated V.fast rate of 28.8K bit/sec.

V.32terbo is designed for compatibility with such standards as V.32bis, V.32 and V.22bis. V.32terbo modems are also likely to work with V.fast modems, though that is not guaranteed since V.fast isn't complete.

Backers of V.32terbo say it could save users money now while V.fast might not be finalized until early 1994. V.32terbo would improve transmission speeds by as much as 33% over V.32bis, lowering transmission times and costs.

The V.32terbo scheme is backed by AT&T Paradyne, National Semiconductor Corp., Penril DataComm Networks, Inc. and

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Penril fills in gaps in product lines

By Skip MacAskill
Staff Writer

WASHINGTON, D.C. — At next week's ComNet '93 conference here, Penril DataComm Networks, Inc. will roll out an enhanced bridge, a new low-end router and modem, as well as multiplexers that integrate voice, facsimile, data and local-area network traffic.

The DVX muxes combine voice compression and multiplexing to optimize bandwidth and reduce costs. The devices can use bandwidth freed up by voice compression to send data or fax traffic. The DVXs automatically adjust to changing needs, and if no voice traffic is present, all bandwidth can be allocated for data.

The modular member of the mux family, the DVX650, also provides a call-switching feature that allows voice or fax toll calls to be switched within the network so only a local call is needed to reach the final destination.

The DVX650 is an eight-slot device that supports up to eight voice/fax channels and six data ports on one full-duplex wide-area network link up to 128K bit/sec. Available in February, it costs from $4,200 to $13,000.

The DVX600 is a stand-alone version that combines one compressed voice channel and one synchronous data channel over a WAN link at speeds up to 19.2K bit/sec. Also available in February, it costs $2,500.

The company will also introduce a low-end multiprotocol router, the Series 1710, which supports one WAN and two Ethernet interfaces and can route between local segments and the WAN simultaneously.

It will route Transmission Control Protocol/Internet Protocol, Novell, Inc. Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX) and Xerox Network Systems traffic using the Router Information Protocol, Exterior Gateway Protocol and Hello routing protocols. The Series 1710 also supports the IEEE 802.1d and Digital

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MCI users express concern

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tion," said the manager, who requested anonymity. "We [would have] had to move to a multiyear deal just to reduce the increase."

The utility is buying access on a monthly basis and is paying 14.9% more for dedicated access from its headquarters to the MCI network under the new fixed-pricing plan. The company could save a meager $20 a month on dedicated local access by signing up for a three-year term plan but is unwilling to make that commitment.

"No one commits to anything for three years in this industry," the manager said. "Things change too quickly, so you want the freedom to look at other [options]."

David Goodtree, senior manager of national accounts access marketing for MCI, acknowledged that some users will pay more if they do not move to a term plan. Even if they move to a one- or two-year plan, they could still pay more, he added.

And that's a problem for the utility. "MCI is our primary carrier and has been for a long time," the manager said. "We value our close relationship with MCI but are extremely upset about their access pricing strategy."

Other longtime MCI users are upset about the carrier's approach to pricing dedicated local access, which can account for as much as half the cost of an end-to-end private line.

"This is having a very negative impact on MCI customers," said a network manager at a Columbus, Ohio, energy company who asked not to be named. "Those that go with the longest term contract could only end up with a wash."

> "No one commits to anything for three years in this industry," the manager said.

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The energy firm has bought dedicated access to the MCI network on a contract basis and is considering a switch to another carrier. "This won't help MCI's chances of keeping our business," the net manager said. "But at the same time, it won't be viewed as a make-or-break aspect of our analysis."

Industry analysts also expressed dismay.

"This is going to be anything but a big hit with current MCI customers," said Daniel Briere, president of TeleChoice, Inc., a Montclair, N.J., consultancy. "I don't understand why MCI has decided on this strategy."

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Backers of fast E-net woo allies

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these firms were officially expressing neutrality, and 3Com refused to make any comment on the meetings.

HP was also lining up support, including Ungermann-Bass, Inc. and Wellfleet Communications, Inc. Both have officially endorsed the HP-AT&T proposal.

And both camps are doggedly pursuing Novell, Inc. Two weeks ago, HP announced that Novell had endorsed its technology, called 100Base-VG, and issued a statement from Novell saying, "[HP and AT&T] have Novell's endorsement and full support for 100Base-VG."

However, SynOptics last week said, "Novell has completely backtracked from that. The industry is against what [HP and AT&T] are trying to do."

When Novell was contacted, officials said the company supported the HP-AT&T plan because it would not change current wiring schemes but was reconsidering that backing because it had not done its homework on carrier-sense multiple access with collision detection.

100Base-VG would require changes to Ethernet's media access control protocol, which is based on CSMA/CD.

Finally, Novell issued an official statement from Darryl Miller, executive vice president of marketing services, which said, "There is no way we would endorse one mechanism over another." He said Novell would support whatever is chosen as a standard.

Brice Clark, strategy and planning manager for HP's Roseville Networks Division, responded that Novell was still firmly in its camp, saying, "We have had many talks with Novell, and although its support of our technology does not preclude supporting another, Novell is committed to producing multimedia products that take advantage of 100Base-VG."

There was also some confusion as to AT&T's role. Two weeks ago, Doug Spreng, vice president and general manager of 3Com's Network Adapter Division, said AT&T may abstain from voting this week. "They make the silicon for our Etherlink product line," he said. "We told them that if we lose this vote, it could affect our future business. And that's a lot of money."

A spokesman for AT&T, however, said the carrier will be making a joint presentation with HP on behalf of 100Base-VG and that it would be participating in any votes at the meeting.

There is even debate over whether the HP-AT&T plan actually belongs in the Ethernet committee. If the group decides to move it out, HP will still forge ahead and demonstrate 100Base-VG at INTEROP 93 Spring in March.

To further complicate matters, the committee is also expected to hear a 100M bit/sec Ethernet proposal from Grand Junction Networks, Inc. that would require Category 5 cabling shielded twisted-pair wiring. The other two camps are proposing Category 3 cabling.

Senior Editor Caryn Gillooly contributed to this story.

IBM plots net mgmt. rollout

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Internet Protocol nets. The product is intended to give big LAN management capabilities to companies with small LANs.

"This is a starter set for the smaller users who can't justify a full-blown AIX NetView/6000 implementation," said John McConnell, vice president of the Infonetics Institute consultancy in Boulder, Colo. "It will probably be able to handle about 50 nodes on a TCP/IP net."

The larger AIX NetView/6000, by contrast, has no practical limitation on the number of SNMP devices it can control, IBM said.

Currently, the full-scale NetView/6000 product costs $10,450. Analysts expect the Lite version to come in at about half that price.

For the 6611 router, sources said IBM is going to add Management Information Base extensions with the router's next software release that will let NetView/6000 monitor the wide-area communications links from the 6611.

Currently, NetView/6000 can monitor the local links to a 6611, but not the wide-area lines or devices attached to those lines.

For example, if a T-1 link between two 6611s fails, the AIX NetView/6000 would not show an alarm and users would have to deduce on their own what the problem was, said Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. Many users are upset about such "black holes" in their network management systems.

"It is in IBM's best interest to add features to their LAN management platforms that provide complete visibility to all devices," Nolle said.

For users of the host-based NetView system, two new versions of existing NetView service point software, used to tie non-SNA devices to NetView, will also be announced and demonstrated at ComNet.

Automated Network Management, Inc. of San Juan Capistrano, Calif., will unveil a new version of its OS/2-based Network management Access Program (NAP) while Diederich & Associates, Inc. of South Pasadena, Calif., will be showing a new release of its NetScript product.

The new version of NAP sends non-SNA device information to IBM's Resource Object Data Manager (RODM), which is then used by GMFHS to build a graphical representation of the user's multivendor net. The user can then point and click on any device or devices on-screen, and restart, shut down or gather more data on those devices automatically and simultaneously. Earlier versions of NAP did not have the point-and-click capabilities, nor ties to RODM and GMFHS.

NAP will be passing net management data to NetView from 14 vendors' products, including Fibermux Corp.'s LightWatch and Sync Research, Inc.'s new mini-SNAC (see "Sync adds SNMP to SNAC," this page), as part of a large IBM ComNet display of NetView multivendor monitoring capabilities.

Diederich's new version of NetScript also adds support for GMFHS and lets customers build objects that can be stored in IBM's RODM for automatic retrieval by GMFHS.

The new versions of NAP and NetScript will make it easier for users to build graphically informative and more useful service point applications, the vendors said.

"We've talked about making NetView a powerful manager of managers in the past," said Robert Shaw, a program manager in IBM's network management solutions development group. "With GMFHS and NetView Version 2 Release 3, we are giving it the tools to do the job."

IBM is also developing its own tools to help users more easily build RODM objects, Shaw said.

Analysts said IBM would also use ComNet to announce additional AIX SystemView NetView/6000 Association members. The association is designed to help spur third-party application support for the platform.

"Lack of applications for the AIX NetView/6000 product are its weakest point," McConnell said. "IBM is going to move aggressively to fill in that hole."

Analysts could not confirm what the new applications would be, but several companies will be demonstrating AIX-based applications at the IBM ComNet booth.

SMDS group wins backing

continued from page 4

ternational Corp. and includes organizations such as the Numerical Aeronautical Simulation Program (NAS) at the National Aeronautics and Space Administration's Ames Research Center, the Federal Reserve Board and United Healthcare Corp. Rockwell and NAS were early Pacific Bell SMDS trial participants.

SMDS is a high-speed, packet-oriented digital data service that supports transmissions at 1.17M bit/sec using T-1 access links and at 34M bit/sec using T-3 access facilities. Carriers have positioned SMDS as a service for local-area network interconnection, videoconferencing and multimedia applications.

Although numerous organizations are considering SMDS, smaller locations are put off by the need for T-1 access pipes. The advent of frame relay access at 56K and 64K bit/sec represents a solution to the problem.

Customer response to frame relay access to SMDS has been good, said Ken Hawkins, inventor of the concept and broadband services product manager at BellSouth Telecommunications, Inc. "We've had a number of companies say they won't use SMDS without it."

Jerry Pruett, chairman of the SMDSIG's Sub-DS1 Committee and a manager at BellSouth Telecommunications, said the subcommittee could formally approve a specification for frame relay access to SMDS at the meeting here next week.

Sync adds SNMP to SNAC

IRVINE, Calif. — Sync Research, Inc. last week announced Simple Network Management Protocol support for its IBM gateway product, making it one of the first SNA devices capable of being managed by both IBM's NetView and third-party SNMP management systems.

Sync has added an SNMP agent to its Systems Network Architecture Converter (SNAC)/Token-Ring Concentrator (TRC), a Synchronous Data Link Control-to-Logical Link Control 2 (LLC2) conversion device that lets users attach cluster controllers to token-ring local-area networks.

That agent, combined with the device's existing capabilities, will enable both LAN and SNA administrators to monitor and control the SNAC. Previously, the SNAC/TRC could only be managed by NetView.

Alan Blaustein, president of Maxnet Communications Systems, Inc., a Fort Lauderdale, Fla.-based network integrator, said the ability to manage SNA devices from SNMP-based management platforms is an increasingly critical requirement.

"Our corporate users are demanding a standards-based platform from which they can manage their complete network, and SNMP is the clear winner as the standard for managing enterprisewide nets," he said. "Even IBM has accepted that fact by making NetView 6000 SNMP-compliant."

The SNAC device supports all standard SNMP Management Information Bases (MIB) as well as a proprietary SDLC MIB that Sync is jointly developing with Cabletron Systems, Inc. The SDLC MIB, which will provide a complete view of the downstream SDLC lines and cluster controllers, will be submitted to the Internet Engineering Task Force (IETF) this spring as the basis of an SNA standard MIB.

The SNMP support will be available by midyear as a free software upgrade.

In a related matter, a team of SNA gateway vendors met for the first time last week to begin work on a standard MIB that will enable their products to be managed from a central SNMP console ("SNA gateway vendors seek SNMP mgmt," *NW,* Nov 2, 1992).

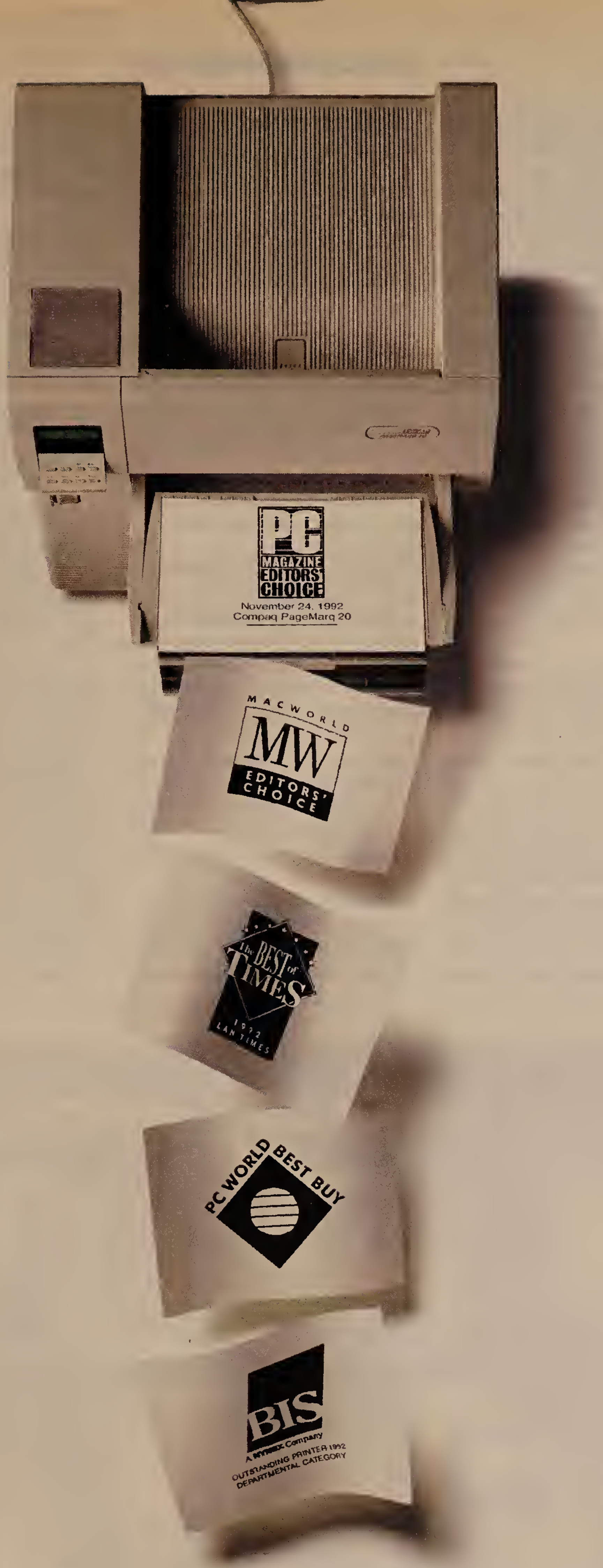
In addition to various SNA gateway vendors, Digital Equipment Corp., IBM and SunConnect were on hand to support the initiative by submitting their proprietary MIB definitions to the group, said Michael Bowman, vice president of marketing at Netlink, Inc.

Bowman said the group will meet again at the March IETF meeting in an effort to obtain IETF working group status and get the MIB defined.

The proposed MIB would enable users to monitor and perhaps control all of their SNA devices from a centralized SNMP-based management system such as Hewlett-Packard Co.'s OpenView or SunConnect's SunNet Manager.

"The set of SNA MIBs that come out of the standards process would be used for the management of subarea SNA nets, SNA gateways and [Advanced-Peer-to-Peer-Networking] nodes," Bowman said.

— *Maureen Molloy*



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T-1 vendors jockeying

continued from page 1

mystery.

Newbridge is banking its strategy on ATM switching technology it is acquiring from MPR Teltech, Ltd. for its high-end 36150 MainStreet mux. The multiplexer will combine TDM and ATM buses for circuit and cell switching over T-1 and T-3 links. The 36150 is scheduled to ship in the second quarter.

The 36150 will be able to use the same Fastbus modules as Newbridge's 36120 MainStreet Packet Transfer Engine frame relay switch, which debuted last summer, according to James Michaels, assistant vice president of network planning at Newbridge.

StrataCom's announcement two weeks ago of the Broadband-PX (BPX), a 9.6G bit/sec ATM cell switch, is another T-1 player that analysts say is well positioned to migrate to ATM.

Besides the new ATM switch, the company announced an alliance with AT&T and Cisco Systems, Inc. to build gateways that link frame relay nets to ATM backbones. The gateways are a vital piece in migrating StrataCom's installed base of IPX switches to broadband ATM nets.

StrataCom has experience in cell switching because its IPX uses 24-byte cells. Also, 80% of the software used in StrataCom's IPX switches is used in the BPX devices, easing interoperability between the two switches, said StrataCom President Dick Moley.

A year ago, Ascom Timeplex introduced the Synchrony Service and Transport System Synchronous Optical Network (SONET) mux as its strategic platform for delivering wide-area ATM switching services. Company officials said Synchrony would include circuit and packet buses and recognize the proprietary protocols of the firm's Link+ TDM muxes, thus enabling Synchrony to act as a peer in Link+ networks.

Synchrony was introduced as a 300M bit/sec SONET mux that, with the addition of an ATM switching matrix, would be able to scale up to 2.4G bit/sec. It was to be delivered midyear.

But, citing user requirements for a lower capacity device, Ascom Timeplex backed off on its initial plans and will instead roll out a 50M bit/sec switch in the fourth quarter, according to Bruce McClure, vice president and general manager of Ascom Timeplex's Advanced Products business unit.

The company also recast its ATM strategy — Synchrony is no longer its strategic ATM switch. Instead, Ascom Timeplex is developing an integrated, premise-based ATM LAN/WAN hub/switch to serve as its ATM platform.

The device, which company officials call the internodal processor (INP), will support circuit and packet switching, as well as ATM cell switching and local-area network routing, according to McClure. Like Synchrony, it will also recognize the Link+ protocols, Ascom Timeplex officials said.

Analysts believe the INP will have a multigigabit backplane and, at the high end, support ATM port speeds of 600M bit/sec. As a wide-area switch, the INP will support T-1, T-3, and frame relay interfaces on the network side, and Ethernet, token-ring and FDDI interfaces on the local side, McClure said.

The switch will support ATM interfaces on the local- and wide-area side as the market demands, he added.

One ATM switch to be unwrapped next week at ComNet '93 in Washington, D.C. is owned by GDC. Although the firm would not reveal details about the switch, it said its existing Megamux Transport Management System (TMS) lends itself to ATM migration.

According to Jonathan Reeves, GDC director of systems architecture, the TMS equipment already performs cell-type switching, called microcell switching. Microcells are 20-bit cells that transmit switching instructions inside the TMS node.

The switch will support ATM interfaces on the local- and wide-area side.

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"Because we use microcells internally, we can then adapt to ATM interfaces as we go forward," Reeves said. "So when a customer buys a TMS system, they're buying something that will be upgradable to provide ATM interfaces."

The ATM interfaces for the TMS mux have not been announced yet by GDC, but they are called Broadband Transfer Modules (BTM), Reeves said. BTMs will package data into 53-byte ATM cells and serve as a native-mode ATM interface between the TMS and ATM switches.

NET is one vendor that has not explained how its users will migrate from TDM to ATM. NET's Adaptive Corp. subsidiary makes local-area ATM and high-capacity SONET switches. NET and Adaptive are currently engaged in discussions concerning how best to add ATM capabilities to NET's IDNX multiplexer product line.

With Adaptive and packet-based products such as the LAN/WAN Exchange and Frame Relay Exchange that work with the IDNX bus, NET has all of the pieces for a wide-area ATM offering, according to analysts. But they still have to figure out how to bring ATM to their installed base of IDNX users.

"I think NET has all the pieces in-house, [but] they haven't put them together yet," said Rick Malone, principal analyst at Vertical Systems Group in Dedham, Mass. "There is no net management link between the Adaptive products today and the IDNX products. Those products are compatible but not interoperable."

A smart way to spe

Vendors rallying around scheme

continued from page 4

others (see graphic, this page).

AT&T Paradyne will be among the first to support V.32terbo. Next month, the company will offer a free V.32terbo upgrade to its Comsphere 3800 V.32bis modems, said Rich McCartney, a product marketing manager for AT&T Paradyne in Largo, Fla.

While V.32terbo might seem like a boon for users, some vendors see a dark side.

"V.32terbo is a push by a handful of companies to stretch existing products and create noise in the market; that's not a benefit to the end user," said Julio Siberio, division vice president for analog products at Racal-Datacom, Inc. in Sunrise, Fla.

That confusion will give V.32terbo backers time to catch up with other vendors building products to V.fast, a major upgrade from V.32bis, he said.

Racal-Datacom, General DataComm, Inc. and others have announced modems that support speeds higher than 14.4K bit/sec using proprietary technology. They have pledged to upgrade the modems to comply with V.fast.

Dick Stuart, vice president of technology at Penril, said the introduction of these proprietary high-speed modems have forced companies like his to rally around V.32terbo.

"We can't just sit there," Stuart said. "The real crux of the problem is those vendors coming out with pseudo V.fast products."

Copies of the V.32terbo specification are available by calling AT&T Paradyne at (800) 482-3333, Ext. 585 and asking for document 3800-A2-GK21-00. Other vendors will also make the specification available.

Modem vendors backing V.32terbo

ATI Technologies, Inc.
AT&T (EasyLink, Microelectronics and Paradyne units)
COM 1
CXR Telcom
Dataflex Design, Ltd.
Data Race, Inc.
Digi-Com Systems, Inc.
E-Tech Research, Inc.
Exar
Global Village Communications
Multi-Tech Systems, Inc.
National Semiconductor Corp.
Nokia Telecommunications Corp.
Penril DataComm Networks, Inc.
Phylon
Sonix Communications, Ltd.
Xircom, Inc.
Zypcom, Inc.

Retix products centralize mgmt.

continued from page 2

connection Product Unit. The gateway then maps the addresses to corresponding X.400 addresses, wraps that data in an X.400 envelope and sends it to the OpenServer DXS via an X.400 backbone, he said.

OpenServer DXS uses the information to update its database, which includes a master copy of all mail directories, and then propagates the updated master to each local directory in an address format that is familiar to users of those directories, according to Neiser.

Initially, DXAs will be available on Retix's Microsoft Corp. Mail-, Novell, Inc. Message Handling Service (MHS)- and cc:Mail-to-X.400 gateways.

Communications between the Retix directory products and other vendors' directories will be accomplished via a directory exchange protocol published by Retix and made available to the industry, said Bob Crawford, vice president and general manager of Retix's OSI Business Unit.

The protocol, which has been pitched to the X.400 Application Program Interface Association, was designed so that it could be used with X.500 directories in the future.

According to Neiser, the new products are designed to reduce manual updates of local directories. They also enable end users to send mail using familiar address formats to users not on their local E-mail system.

Meet the manager

The other new product in the family is the OpenServer Remote Manager, a package that runs above Microsoft DOS and Windows 3.1 on Intel 386-based PCs and monitors Retix OpenServer 400 message routers equipped with new OpenServer Management Agents.

OpenServer 400s route X.400 data between gateways across local- or wide-area network backbones. Previously, these message routers could only be managed locally.

The OpenServer Remote Manager taps the routers' agent software to provide E-mail administrators with a Windows 3.1-based map of the network, complete with flashing icons signifying problem areas. Users can also analyze the performance of specific devices by accessing log files via the agent software.

The management agents will be available first on Unix-based OpenServer 400s and later on DOS and OS/2 versions.

Retix has developed a proprietary management protocol that uses X.400 links to communicate between its management system and message routers. The management system will be upgraded to support the Common Management Information Protocol down the road, Neiser said.

The management agents will also be enhanced to alert the management system of problems. Currently, they must be polled.

The OpenServer DXS, which begins at $9,995, and the OpenServer Remote Manager, which costs $2,995, will be available this quarter.

The DXA-enabled OpenServer Gateways to X.400 for cc:Mail and Microsoft Mail will be available in the first quarter, while the MHS gateway will ship in the second quarter. The gateways cost $1,995 each.

OpenServer 400 for Unix Version 1.5 supports the management agents and will be available this quarter. Its pricing begins at $5,995.

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SW56II	Accunet Sw. Digital	56 Kbps	4-wire Sw. Digital	Keypad, Autodialer
DU170	Datapath Sw. Digital	64 Kbps	2-wire Sw. Digital	Keypad, Autodialer
TA110	Terminal Adapter	1 Ch. @ 64K 1 Ch. @ 16K	ISDN	X.25 PAD
TA120	Terminal Adapter	2 Ch. @ 64K 1 Ch. @ 16K	ISDN	Supports Voice & Data
TA220	Terminal Adapter	2 Ch. @ 64K 1 Ch. @ 16K	ISDN	Combines "B" Channels
FT100S	DSU/CSU	56K-1.544Mb	T1/ Frac. T1	Single Port
FT100	DSU/CSU	56K-1.544Mb	T1/ Frac. T1	Dual Port (Expandable)
DDS/MR1	DSU/CSU	56 Kbps	DDS	All DDS Rates
DDS/V.32	DSU with V.32 Modem	56 Kbps	DDS/ Analog	Auto-dial Backup
T1-ESF-CSU	CSU	1.544 Mbps	T1	ESF & D4 Framing
Digital-DBU	Digital Dial Backup	56K-1.544Mb	DDS/ Frac. T1	Universal Digital Dial Backup

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John Boyd
Supervisor of communications systems
Northeast Utilities
Hartford, Conn.

Data Packets

The Network Access Division of **Telco Systems, Inc.** has announced an inverse multiplexing module for its Route-24 T-1 muxes and DCB-24 channel banks. It lets users access switched 56K bit/sec carrier services using idle bandwidth on their dedicated T-1 lines and pool the lower speed links into high-speed data streams. The inverse multiplexing module incorporates an RS-366 interface for pushbutton dialing from video systems and a V.25bis interface for high-speed dialing from local-area network bridges and routers. The module costs $4,500 and will be available in the second quarter.

Tivoli Systems, Inc. said it has ported its object-oriented distributed management software to Hewlett-Packard Co.'s HP 9000 RISC-based workstations and servers. Both firms will jointly market the Tivoli Management Environment to HP system users.

The port allows HP users to run the Tivoli Management Environment and HP's OpenView management system on the same workstations and servers, and take advantage of both platforms' management functions. Tivoli and OpenView technology are used in the Open Software Foundation, Inc.'s Distributed Management Environment. ◪

T3plus' channelized T-3 supports carrier switching

Users can additionally inverse multiplex T-1s.

By Jim Duffy
Senior Editor

SANTA CLARA, Calif. — T3plus Networking, Inc. last week brought out modules for its BMX45 T-3 multiplexer that will help users get the most out of T-3 access links and support high-speed wide-area links via inverse multiplexing.

The new DS3c and DSX-3 channel interface modules each support channelized T-3 links, while new High Speed Data-channel (HSDc) module and HSD channel interface module (HSD CIM) perform inverse multiplexing of those channels, allowing users to form multimegabit wide-area links from switched T-1s. They are designed to enable users to take advantage of the cost efficiencies of combining carrier-based services with dedicated private lines.

The DS3c and DSX-3 modules support two T-3 interfaces and let users dedicate individual T-1 channels within the T-3 to different applications. Carrier-based services can then be employed to route the individual T-1s to different locations, allowing users to consolidate traffic over a single high-speed carrier access link to reduce costs.

The HSDc and HSD channel interface modules are dual-port cards sporting either High Speed Serial Interface (HSSI), V.35 or RS-422/449 ports. Data rates on the HSSI ports range from 1.58M to 44.21M bit/sec, as do data rates on the V.35 ports. The RS-422/449 ports support data rates from 1.58M to 9.47M bit/sec.

The modules also perform inverse muxing, allowing users to split multimegabit channels into multiple switched T-1 circuits and then pool those switched T-1s back into the original multimegabit channel.

For example, a 6M bit/sec channel coming from a router

(continued on page 14)

Larse set to deliver new low-end inverse muxes

By Michael Cooney
Senior Editor

SANTA CLARA, Calif. — Larse Corp. is expected to announce next week the Mega-T Model 200, an inverse multiplexer that lets users logically combine two T-1 links to form a single 3M bit/sec link.

The Mega-T Model 200, like the existing Model 400, is intended to provide an economical way for users to support high-speed links that connect devices such as routers and bridges.

The Model 200 provides the synchronization required on both ends of two dedicated T-1 1.544M bit/sec links to combine them into a single 3M bit/sec bandwidth channel, said Debbie Soon, Larse's vice president of marketing.

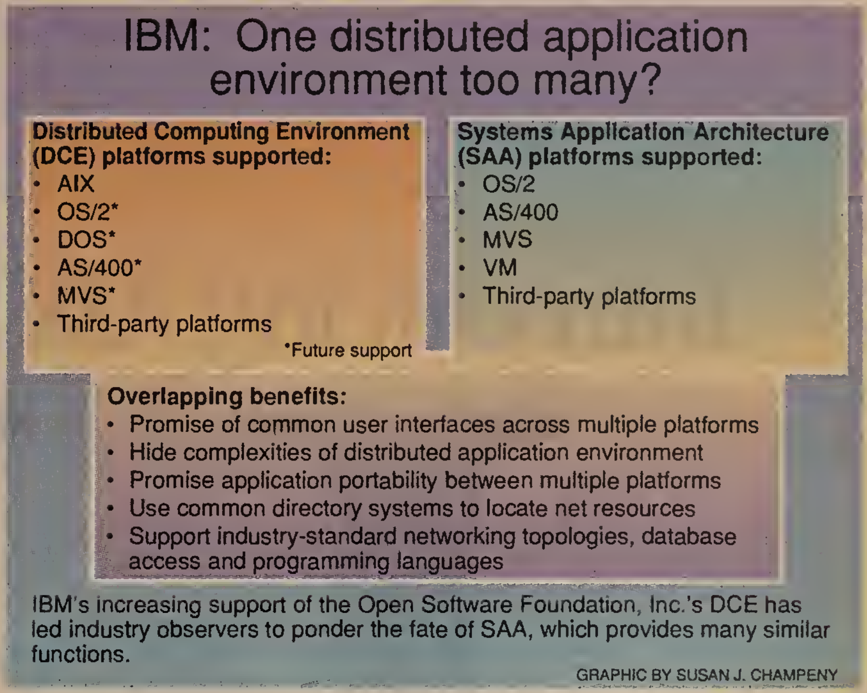
The Model 200 supports one V.35 interface for connections to local devices such as routers or bridges. It supports two wide-area T-1 interfaces but ships with two additional T-1 interfaces that can be activated with an upgrade to the box's software. The software upgrade converts the Model 200 into the Model 400.

The larger Model 400 supports four T-1 lines, creating a bandwidth pool of up to 6M bit/sec. It comes with one V.35 interface or a High Speed Serial Interface, which can support local transmissions up to 52M bit/sec.

The Model 200 will not only let users building LAN/WAN internets gain access to high-speed internet connections, but will also let them support disaster recovery and backup applications. "The Mega-T boxes let users build high-speed networks incrementally," she said.

The boxes contain a Simple Network Management Protocol agent that lets them be managed by any SNMP management system. They also can be managed by Larse's Prophecy manager.

The Model 200 will be available in the second quarter with prices starting at $9,950. The 400 is available now for $14,500. ◪



IBM: One distributed application environment too many?

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- AIX
- OS/2*
- DOS*
- AS/400*
- MVS*
- Third-party platforms

*Future support

Systems Application Architecture (SAA) platforms supported:
- OS/2
- AS/400
- MVS
- VM
- Third-party platforms

Overlapping benefits:
- Promise of common user interfaces across multiple platforms
- Hide complexities of distributed application environment
- Promise application portability between multiple platforms
- Use common directory systems to locate net resources
- Support industry-standard networking topologies, database access and programming languages

IBM's increasing support of the Open Software Foundation, Inc.'s DCE has led industry observers to ponder the fate of SAA, which provides many similar functions.

GRAPHIC BY SUSAN J. CHAMPENY

Support for DCE puts the squeeze on SAA

Industry watchers say IBM's increasing support for DCE may be sign of eventual SAA phaseout.

By Michael Cooney
Senior Editor

NEW YORK — IBM's increasing support for the Open Software Foundation, Inc.'s Distributed Computing Environment (DCE) may be sounding a death knell for its Systems Application Architecture (SAA).

At a time when IBM is cutting money from research and development and decreasing its work force, many industry observers wonder if the firm can afford to develop and support two architectures that define the same basic functions.

SAA, introduced in 1987, is intended to support consistent, integrated user access to applications residing on its primary operating systems — MVS, VM, Application System/400 and OS/2. Its main purpose is to let users more easily build distributed, cooperative processing applications that span different hardware platforms.

Over the years, SAA plans have been criticized as being long on rhetoric and short on products.

DCE is the OSF's set of standards for building distributed, multivendor cooperative processing applications. Multivendor DCE products are just now beginning to appear in user networks.

While the DCE environment has been developed primarily for Transmission Control Protocol/Internet Protocol and Unix environments, it is clear from IBM's announcements last week that its support of DCE will move beyond TCP/IP ("Top IBM, Novell officials detail future DCE support," *NW*, Jan. 18).

For example, IBM will ultimately support DCE over LU 6.2, the peer-to-peer session-type in Systems Network Architecture. LU 6.2 is the underlying data stream for SAA, but many industry observers think users will base distributed applications on DCE rather than SAA.

> SAA plans have been criticized as being long on rhetoric and short on products.
>
> ▲▲▲

"By letting OS/2 users [employ] LU 6.2 to other OS/2 users using DCE, IBM short-circuits SAA altogether," said Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. "At the very least, it makes a much more powerful and easy to use alternative to SAA."

DCE-based applications are easier to build, mostly because of

(continued on page 14)

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DCE puts the squeeze on SAA

continued from page 11

the relatively simple structure of its remote procedure call (RPC), Nolle said. RPCs are the communications facility used in DCE.

IBM noted, however, that users interested in migrating legacy applications to DCE would be faced with a daunting task.

Unless an application was written in C language, it would have to be rewritten — a task many users do not want to take on, analysts said. Of course, users would face the same task in making legacy applications SAA-compatible, they added.

A report issued by Forrester Research, Inc., a research firm in Cambridge, Mass., last year said monolithic frameworks such as SAA were falling out of favor with users and that they were moving toward more customizable, local-area network-based architectures.

"IBM has tried to set the Fortune 1,000's software agenda, but its efforts haven't panned out," said Forrester's Stuart Woodring, director of software strategy research. "Users need quick, efficient access to a range of information, not reshaped data from corporate applications."

The Forrester report concluded that IBM would at some point get out of the "galactic architecture game."

For its part, IBM denies it is de-emphasizing SAA. IBM executives maintain that the two environments will continue to be developed and that they show no signs of weakening SAA support.

"We see SAA as the linking architecture between our homogeneous platforms, whereas DCE is more heterogeneous," said Mike Machete, product manager for IBM's distributed systems group in Austin, Texas. "Eventually, the two environments will move together to provide users with the ability to build mixed heterogeneous environments."

Still, not everyone is convinced both environments will be supported indefinitely. Nolle said IBM's growing DCE support may be an indication of what will happen as IBM's business lines become increasingly autonomous. "The business units might pick the technology that'll solve problems the quickest, and it might not be IBM technology in some cases," he said.

Other analysts agreed, saying IBM would use DCE technology rather than spend money developing distributed networking products on its own.

"IBM now has a source for standardized distributed network building blocks, so why build them itself," said Dick Boyle, program director for local-area communications at Gartner Group, Inc., a research firm in Stamford, Conn. ◘

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Channelized T-3 allows switching

continued from page 11

can be divided into four switched T-1 channels between two BMX45 multiplexers, then pooled back into a 6M bit/sec circuit. This allows users to employ less expensive switched services to augment their dedicated lines.

Inverse muxing is usually deployed to bundle 56K bit/sec circuits into larger pipes, including T-1. But T3plus claims it is the first vendor to offer inverse muxing and channelized and nonchannelized T-3 in a single product.

> T3plus says it is first to offer inverse muxing and channelized and nonchannelized T-3 in a single product.
>
> ▲▲▲

Analysts agree, adding that the new features make T3plus' BMX45 more flexible.

"Before, they were limited to unchannelized transmission, which meant users were limited to private lines at T-3 end-to-end," said Rick Malone, principal of Vertical Systems Group in Dedham, Mass. "They now have the ability to support any transmission alternative the carrier can offer."

Other applications for the channelized T-3 support include the use of switched T-1s for disaster recovery and backup of a T-3 trunk. Previously, users could only use another T-3 as a backup for multimegabit circuits.

Also, users can deploy M13 multiplexers as feeders into a BMX45 in order to access the switching and alternate routing capabilities of the T-3 mux.

The DS3c and DSX-3 modules cost $13,400. The HSDc and HSD CIM modules cost $10,400. The modules will be available in March. ◘

LOCAL NETWORKING

LAN HARDWARE, NETWORK OPERATING SYSTEMS AND LAN MANAGEMENT

Worth Noting

"We've learned from our mistakes. [The Distributed Computing Environment] is a living standard. We won't be trying to solve 10-year-old problems by the time it arrives."

Jonathon Gossels
Director of business development
Open Systems Foundation, Inc.
Cambridge, Mass.

Netnotes

Sun Microsystems Computer Corp. of Mountain View, Calif., last week introduced the Network Terminal Server, designed to connect up to 64 terminals or other serial peripherals to Sun's Solaris-based local-area networks.

The desktop- or rack-mounted Network Terminal Server connects to any Sun server. Each terminal server has 64 serial ports and one parallel port, and multiple terminal servers can be used to enable thousands of devices to be connected on a single net.

The server will cost $6,990 and will begin shipping in February.

Also last week, **Sun Microsystems, Inc.**'s **SunSelect** business unit unveiled Version 3.1 of its SunPC software, which adds support for Novell, Inc.'s NetWare to existing support for Network File System servers.

SunPC is designed to let users of scalable processor architecture workstations run DOS, Windows and Unix applications on the same system. The enhancements allow the workstation to run applications that reside on NetWare local-area networks.

SunPC Version 3.1 will be available Feb. 21.

Novell offers perks of NFS to Unix users at small sites

Starter kit gives NetWare capabilities to 5 users.

By Caryn Gillooly
Senior Editor

SAN JOSE, Calif. — Novell, Inc. last week brought Network File System (NFS) capabilities to smaller networks with the release of the NetWare NFS Starter Kit, a five-user version of its existing NetWare NFS software.

The starter kit provides the same NFS file services and bidirectional print capabilities to Unix clients on NetWare local-area networks as NetWare NFS but for a smaller number of clients.

The product consists of a set of NetWare Loadable Modules to run on a NetWare 3.11 server. In addition to NFS file services and the print gateway, the software includes a File Transfer Protocol (FTP) gateway that lets FTP clients access files on any NetWare server on the network and an X Window System console utility for remote management.

"NetWare NFS was only offered in an unlimited version until now" that costs about $5,000, said Bob Davis, vice president and general manager of Novell's Connectivity Products Division, based here. "But if you had only one or two Unix clients, it would be hard to justify $5,000 just to get NetWare integration."

Users agreed. "We see the NFS Starter Kit providing a cost-effective interoperability solution between NetWare and Unix," said Kathleen Mayer, business manager of *The Davis Enterprise* newspaper in Davis, Calif.

The NetWare NFS Starter Kit will be available Feb. 1 for $1,495.

NIC vendors hawk wares at NetWorld

By Skip MacAskill
Staff Writer

BOSTON — Network interface cards (NIC) took center stage at the recent NetWorld 93 Boston show as several vendors rolled out new adapter cards to bolster existing product lines.

Accton Technology Corp., for example, unveiled the RingPair-4/16T and RingPair-MC4/16T token-ring adapter cards that offer 100% compatibility with IBM Token-Ring environments.

The 4/16T can be configured as an 8- or 16-bit Industry Standard Architecture (ISA) NIC that comes equipped with switch-selectable connectors for both unshielded and shielded twisted-pair cable.

The MC4/16T supports 4M or 16M bit/sec token ring for Micro Channel Architecture-based personal computers.

Both NICs use National Semiconductor Corp.'s Token Ring Protocol Interface Controller (TROPIC) chip and support drivers for Novell, Inc. NetWare and Microsoft Corp. Network Driver Interface Specification.

Available next month, the NICs cost $549 each.

Eagle Technology introduced two 16-bit Ethernet NICs, the NE-2000plus and NE2000Tplus, which can be used in ISA and Extended ISA (EISA) machines, as well as all IBM Personal Computers, XTs, ATs and compatibles.

The NE2000plus, which supports thick and thin Ethernet, costs $199, while NE2000Tplus, which supports twisted-pair connectors, is priced at $179. Both NICs are avilable now.

NetWorth, Inc. rolled out both an Ethernet NIC and a token-ring adapter. The UTP32A is a 32-bit EISA 10Base-T NIC based on National's System-Oriented Network Interface Controller chip.

The token-ring NIC, dubbed UTPTRA, supports 4M and 16M bit/sec token ring and is based on National's TROPIC chip.

Available in March, UTPTRA costs $560 when purchased in bundles of five. The UTP32A will be available next month and is priced at $759.

Crescendo Communications, Inc. announced new software driver support for its line of Copper Distributed Data Interface and Fiber Distributed Data Interface adpater cards.

The company will now support Sun Microsystems, Inc. Solaris 2.1, Hewlett-Packard Co. HP-UX Version 8.07 and Novell's Open Data Link Interface.

Novell celebrates 10 years of LAN success

1983	Novell, Inc. forms; releases first network file server software.
1985	Releases LANalyzer network analyzer.
1986	Debuts NetWare 286; acquires Santa Clara Systems, Inc. for storage subsystem technology.
1987	Acquires Softcraft, Inc. for Btreive and programming tools, and CXI, Inc. for LAN-to-host gateway technology.
1988	Releases NetWare for VMS along with support for Apple Computer, Inc. Macintosh clients.
1989	Ships NetWare 386, NetWare SQL, NetWare for Unix; acquires Excelan, Inc. for Unix, Macintosh and standards-based networking.
1990	Releases NetWare MHS, NetWare SNA Gateway, LANtern SNMP-based network monitor; acquires Indisy Software, Inc. for IBM host messaging technology.
1991	Releases NetWare 3.11, NetWare Lite, NetWare for SAA, NetWare NFS, NetWare FTAM; acquires Digital Research, Inc. for DR-DOS technology; announces partnership with IBM.
1992	Ships NetWare Router, NMS console, Hub Services Manager; announces NetWare 4.0 and SFT III; acquires International Business Software, Ltd. for virtual server technology, and Annatek Systems, Inc. for automated software distribution technology.

GRAPHIC BY SUSAN SLATER

SOURCE: NOVELL, PROVO, UTAH

New battles loom for 10-year-old Novell

The next decade promises new challenges of changing market, leadership, role for company.

By Joanne Cummings and Caryn Gillooly
Network World Staff

"Despite Novell's strong current position in accounts, our research shows that Novell will lose some of its customer base to a variant of LAN Manager. NetWare is not viewed as a viable foundation for client/server applications or for large interconnected networks, and LAN Manager is." — Forester Research, Inc., 1990

As Novell, Inc. this week celebrates its 10th birthday, the company can reflect on having successfully weathered a range of challenges to become a market leader, but some say its toughest battles may still lie ahead.

Over the past 10 years, Novell has not happened upon success. Through its ability to move nimbly to accommodate changing market demands, its focus on partnerships and the leadership of Chief Executive Officer Raymond Noorda, Novell has brought itself from near bankruptcy to local-area net market leadership.

But the next 10 years will be completely different. First, as it becomes more successful, the company will continue to grow. While Novell was a fast moving company in the past, its increasing size will become a greater factor in preventing the firm from enjoying its limber youth much longer.

Also likely to change over the next 10 years is company leadership. Although many people wonder if Noorda will ever retire, an equal number think he is currently in the process of choosing a successor.

Perhaps most importantly, however, is the market itself and Novell's positioning within it.

As more companies trust LANs with their mission-critical enterprise applications, the LAN market is shifting to an enterprise focus. In the face of its growing size and possible leadership changes, Novell must also make the switch from LANs to enterprise networking.

"Novell is facing a real balancing act," said Ann Palermo, research director at International Data Corp., a research firm in

(continued on page 19)

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Multiport Bridge w/WAN Connection	Yes
Logical Bridge/Router	Yes
Redundant F.O. links or ports	Yes
10BaseFL & FOIRL compatibility	Yes
TOKEN RING	
MAX # UTP TR ports/hub	200
MAX # UTP TR networks/hub	40
Dual TR backplane channels	Yes
PLL retiming on every TR port	Yes
COMMON	
Total # backplane channels	4
Allowance for add-on backplane	Yes
Per-port switching, every module	Yes
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# slot positions	20
MANAGEMENT	
Field-upgradable SNMP Agent	Yes
Downloadable agent module software	Yes
Xmit mgmt info on separate channel	Yes

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INTERNETWORKS

LAN-TO-LAN AND LAN-TO-WAN EQUIPMENT AND STRATEGIES

Worth Noting

"Internetworking vendors need to provide users with a solid migration path from where they are to where they want to be. It must be evolutionary, not revolutionary."

David Fowler
Vice president of marketing
Chipcom Corp.
Southborough, Mass.

Link Notes

Cameo Communications, Inc. will unveil a high-performance Ethernet bridge module for its UltraHub 5000 intelligent hub line at ComNet '93 in Washington, D.C. next month. The two-port AH 328-02 bridge module, which supports the Spanning Tree Protocol, will bridge traffic between the four internal backbones within the UltraHub. It can filter traffic at 14,880 packet/sec and forward data at 13,000 packet/sec.

Available in February, the bridge module is priced at $2,495.

Cameo last week also rolled out a four-port Fiber Optic Inter-Repeater Link repeater module for the UltraHub that can be used to link hubs at distances up to 1 km. It comes equipped with Cameo's Autoredundant Mechanism, which creates an alternate link between hubs so if the primary link fails, the module automatically switches over to the secondary link.

The new module is available now and costs $1,895. For more information, contact Cameo at (800) 438-4827.

Olicom USA, Inc. has announced the Olicom Con-

(continued on page 18)

Cisco pares down the price of its AGS+ router system

Vendor also adding several upgrades to device.

By Maureen Molloy
Senior Writer

MENLO PARK, Calif. — Cisco Systems, Inc. last week announced it is lowering the price of its AGS+ router and adding several enhancements.

> The vendor said it will continue to enhance the AGS+ this year in several ways.
>
> ▲▲▲

The price cut came in the wake of last week's announcement of the Cisco 7000 Internetwork Router ("Router makers strive for greater heights," *NW,* Jan. 18), which replaces the AGS+ as Cisco's top-of-the-line system.

The cost of the AGS+ chassis dropped 28% to $9,900, while the cost of the ciscoBus controller was reduced by 50% to $2,200 and its Fiber Distributed Data Interface module was trimmed 15% to $14,000.

More upgrades

The vendor said it will continue to enhance the AGS+ this year in several ways. The maximum number of token-ring ports the router can accommodate will be boosted from eight to 16 when the AGS+ is equipped with four four-port Cisco Multiport Token Ring modules.

Later this year, the AGS+ will also support IBM's Advanced Peer-to-Peer Networking as well as Cisco's own Advanced Peer-to-Peer Internetworking technology.

In addition, the vendor plans to add an interface to the AGS+ that supports Asynchro-

(continued on page 18)

Xyplex to unveil various hub products at ComNet

By Maureen Molloy
Senior Writer

BOXBORO, Mass. — Xyplex, Inc. this week will announce several new products, including an integrated 10Base-T router/hub as well as a new router module and security module for its existing line of intelligent hubs.

The new Network 9003, a router/hub for remote work groups that supports up to 48 10Base-T ports, is a smaller version of the vendor's Network 9000 intranetworking hub unveiled last fall ("Xyplex hub merges net functions into single unit," *NW,* Sept. 28, 1992).

The three-slot hub can support a repeater, terminal server or bridge/router module. When configured with Xyplex's 401 bridge/router modules, the hub can act as an eight-port router that links local users to a central site.

The Network 9003 costs $1,745, with modules ranging in price from $1,995 for a 20-port 10Base-T repeater to $6,995 for a four-port 400 Series bridge/router.

The 6800 module

The second new product, the 6800 bridge/router module for Xyplex's Network 9000 and MAX-server 4000/5000 hubs, is a two-port module with one 10Base-T and one wide-area T-1 port.

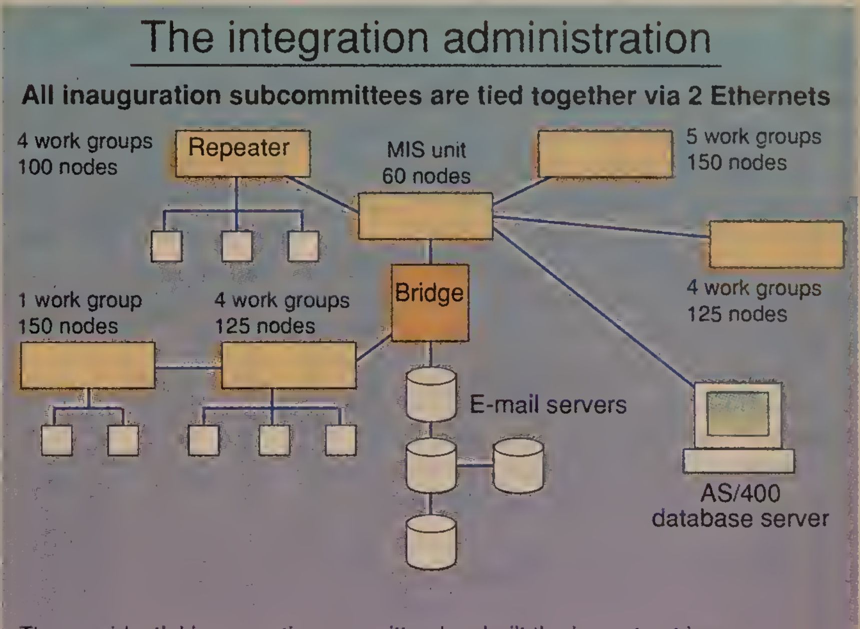
The 6800 supports the Transmission Control Protocol/Internet Protocol, DECnet, Novell, Inc.'s Internetwork Packet Exchange (IPX) and AppleTalk. It also supports the Spanning Tree Algorithm, the Routing Information Protocol and the Open Shortest Path First routing protocol.

By midyear, the vendor will offer an upgrade that will enable the 6800 to act as an X.25 gateway, combining the features of an asynchronous terminal server and an X.25 packet assembler/disassembler.

The 6800 costs $3,495 and is available now.

Lastly, Xyplex will unveil a

(continued on page 18)



The presidential inauguration committee has built the largest net in inauguration history to coordinate everything from planning the balls to issuing parking permits. It supports 22 subcommittees and is designed to reduce paperwork and setup times.

SOURCE: THE 52ND PRESIDENTIAL INAUGURAL COMMITTEE, WASHINGTON D.C.

Inauguration net eases coordination

Donations from dozens of vendors across the industry make net largest in inauguration history.

By Skip MacAskill
Staff Writer

WASHINGTON, D.C. — The multimillion-dollar inauguration of President Bill Clinton went off without a hitch last week thanks in large part to a 700-node internetwork that served as a touchstone for the various inauguration committees that coordinated every aspect of the week-long celebration.

Due to the generosity of several vendors across the industry, a network that started out as a mid-size word processing project turned into the largest network undertaking in inauguration history.

Craig Bensen

"The original objective was to allow people to do word processing, generate spreadsheets and print, but because of the generosity of dozens of vendors, we were able to pull this thing together and make a real enterprise out of it, rather than just a typing system," said Duncan Ritchie, deputy director of MIS and office automation for the 52nd Presidential Inaugural Committee.

As a comparison, the Bush inauguration four years ago had a 50-node local-area network that offered word processing applications and allowed some staff to share printing devices.

The Clinton network consists of an NB-30 bridge and six MR-9000C repeaters donated by Cabletron Systems, Inc. that link hundreds of IBM-compatible personal computers, Apple Computer, Inc. Macintoshes and laptop computers across two LANs and several work groups (see graphic, this page).

The 10Base2 thin net Ethernet, which uses Artisoft, Inc.'s LANtastic peer-to-peer net operating system, is spread across two acres and allows all 22 inauguration subcommittees to communicate and share database and electronic mail servers, thus reducing paperwork and setup times.

Designed to handle all aspects of the week-long inauguration — from issuing press credentials and parking permits to fund-raising and arranging security for the 10 balls — the network came to-

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Inauguration net eases coordination

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gether quite quickly, according to Ritchie.

"A bipartisan inauguration committee started talking with IBM during the summer, but no work was really started until about a week after the election in November," he said. "The fascinating thing was that the day the PCs and Ethernet cards came in the door, we had people up and running. The whole net actually came together in about five weeks."

When Ritchie was brought on board Nov. 19, he contacted Artisoft and it donated 235 Ethernet boards, the LANtastic software and some cabling. "After that, we starting thinking, why don't we try to pull everyone into a single network," he said.

Cabletron, which has had a presence on Capitol Hill for many years, was contacted and it offered the hardware. Other companies soon followed with PC donations, including Apple, Compaq Computer Corp., Digital Equipment Corp., IBM and Zenith Data Systems Corp.

Futurus Corp. offered its DOS-based Team E-mail package, and several other companies, such as Borland International, Inc. and WordPerfect Corp., donated other equipment and software.

The best aspect of the network for the taxpayer may be the cost of installation. With the exception of the cabling and some computer rentals, the rest of the gear and technical help was donated.

"I voted for George Bush, and I thought he was very eloquent when he said let's get behind the new president and make sure he's successful," said Craig Bensen, Cabletron's chairman of the board and chief operating officer. "I think that's in everyone's best interest, so we're just doing our small part to make sure things go off as best they can." ◪

Cisco pares down router system price

continued from page 17

nous Transfer Mode (ATM) data first via an external data service unit and later with a native ATM interface.

In addition, Cisco announced that it will boost the performance of a number of protocols supported by the AGS+, including transparent bridging and source route bridging over FDDI. It will also boost the performance of Novell, Inc.'s Internetwork Packet Exchange (IPX) data to 70K packet/sec and Banyan Systems, Inc.'s VINES and Open Systems Interconnection packets to 25K packet/sec.

In light of the new 7000 router, Brent Bilger, Cisco's director of platform marketing, said the AGS+ will now be positioned as a high-end router to support applications such as large file transfers. The 7000, with its high-availability and redundancy features, will be targeted at user nets in which high reliability is key, such as a stock trading floor. New prices for the AGS+ chassis, the controller and FDDI modules are effective now. ◪

Xyplex to unveil hub products at ComNet

continued from page 17

new security module called the 211 Security Processor. The 211 works with 10Base-T and fiber modules in the hub and scrambles data to all ports but the intended destination node.

When plugged into a Network 9000 hub, the 211 collects a node's unique address from the packet and forwards that packet in clear text only to the addressed node. It then simultaneously sends scrambled data to every other hub-attached node.

The 211 Security Processor costs $1,650 and is available now.

All three products will be demonstrated next week at ComNet '93 in Washington, D.C. ◪

Link Notes

continued from page 17

trolled Access Unit (CAU), a fixed-port token-ring hub that supports as many as 80 nodes and operates at both 4M and 16M bit/sec speeds. The CAU supports as many as four Lobe Access Modules (LAM) that come in two versions: shielded twisted pair and unshielded twisted pair. The device is interoperable with Olicom's multistation access units (MAU) as well as IBM's CAUs and MAUs and can be managed from IBM's NetView and LAN Network Manager.

The company said it will add support for the Simple Network Management Protocol by the second quarter of this year.

The Olicom CAU costs $2,995, while the shielded twisted-pair LAM and unshielded twisted-pair LAM each cost $1,995. All three will be available this month.

For more information, contact Olicom at (214) 423-7560. ◪

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New battles loom for 10-year-old Novell

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Framingham, Mass. "They need to keep the installed base happy with their current systems while showing them a path to future, more sophisticated systems. That's not always easy."

To make a complete enterprise shift, however, Novell must also more successfully attract those users that have historically relied on mainframes and minicomputers.

"Novell must establish NetWare as one of the three or four successors to the mainframe and mid-range systems within today's enterprise networks," said Paul Zagieski, an analyst at The Yankee Group, a research and consulting firm in Boston. "All the money corporations invested in mainframe and midrange systems will evolve into LANs."

Novell executives said NetWare 4.0 — the latest release of the company's network operating system (NOS), expected to be available in March — is the answer to both of those needs. The company contends that NetWare 4.0 will provide the upgrade path necessary to give its current customers higher end capabilities while offering the fault tolerance corporate downsizing customers demand.

NetWare 4.0 will also include a global naming service and support for 1,000 user nets, but analysts say even these capabilities will not make it the quintessential NOS.

"Even with NetWare 4.0, they won't necessarily be addressing the problem," said Cheryl Currid, president of consultancy Currid & Co., based in Houston. To be perceived as an enterprise vendor, Currid said, Novell needs to add the types of capabilities associated with higher end applications such as multiprocessing.

Although Novell is not planning to add multiprocessing capabilities in the near future, company executives pointed to other areas in which the company feels it is meeting enterprise networking needs, such as interconnecting with other vendors' products and services.

From the desktop perspective, Novell plans to release Personal NetWare by the second half of this year, according to John Edwards, executive vice president at Novell's Desktop Systems Group in Provo, Utah. Personal NetWare, he said, is basically client software that will make NetWare clients more "NetWare aware."

Personal NetWare will give NetWare support for any and all clients — including Microsoft Corp.'s Windows NT when it becomes available — and will help customers more easily move to a distributed computing environment.

From an enterprise perspective, Jan Newman, executive vice president and general manager of Novell's NetWare Systems Group in Provo, said the company is currently working with Banyan Systems, Inc. to bring together the two companies' directory services.

"We're talking with Banyan about defining [application program interfaces] and interfaces for integrating our directory services," he said. "We'll be working with them this year as we roll out [NetWare] 4.0." Newman would not provide more specific details.

Analysts agreed this integration will be helpful.

"One of the nightmares of some of the current networked applications is that they have a duplicate, redundant set of services that need to be managed and coordinated," IDC's Palermo said.

Banyan has already taken its own steps toward NetWare integration with the release of Enterprise Network Services (ENS) for NetWare, but ENS lets both Banyan and NetWare users use Banyan's StreetTalk and does not actually integrate two naming services.

The Noorda question

Aside from technology issues, another pressing need is to find a qualified successor to Noorda.

According to Michael Howard, president of Infonetics Research, Inc., a market research firm in Santa Clara, Calif., Novell has recently started to branch out into areas beyond its core NOS, including Unix and multiprotocol routing. Noorda, he said, has helped the company keep its focus.

"While Noorda's around, they'll never get stretched too thin," Howard said. "He'll always make sure that their main NOS business remains intact and has the resources it needs. But when Ray retires? That's another matter."

He said Novell would be hard pressed to find a suitable successor.

"I don't think there's any other key executive there who has the experience Ray does — the vision or the discipline," Howard said. "But experience is the big one. There are a lot of sharp people there, but they don't have that same breadth of experience."

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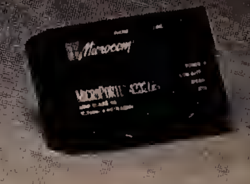

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GLOBAL SERVICES

DOMESTIC AND INTERNATIONAL VOICE/DATA SERVICES, ACCESS EQUIPMENT AND REGULATORY ISSUES

Worth Noting

Revenues from U.S. sales of telecommunications equipment — including telephone systems and teleconferencing products — will rise from $57.9 billion in 1993 to $75.7 billion in 1998, according to a recent study by Market Intelligence, a Mountain View, Calif., research firm.

Regulatory Update

Sprint Corp. again pressed the **Federal Communications Commission** last week to extend the option period during which users can switch from AT&T Tariff 12 service to other carriers' offerings without penalty.

In order to give users the maximum opportunity to benefit from 800 portability, the FCC last year ruled that users should be able to leave their long-term Tariff 12 deals and move traffic to another carrier for 90 days after portability is available. Sprint is asking the FCC to allow users 180 days to switch without penalty.

Additionally, Sprint is asking the FCC to allow all AT&T 800 users with long-term contracts to switch, not just Tariff 12 customers.

Sprint said such measures are necessary to counteract confusion created by AT&T. Sprint said it and other carriers have spent millions of dollars to educate users about the upcoming changes stemming from 800 portability while "AT&T has attempted to thwart the creation of a competitive marketplace by locking up customers in term plans and other promotions."

Sprint details SONET plans, issues RFP for equipment

Network bandwidth to be increased twelvefold.

By Bob Wallace
Senior Editor

KANSAS CITY, Mo. — Sprint Corp. last week issued a request for proposal for Synchronous Optical Network (SONET) equipment that will position the carrier to eventually offer an array of high-bandwidth services.

Sprint said it will spend more than $500 million over the next five years for the SONET equipment and will bring 12 SONET routes on-line by year-end 1994.

SONET supports transmission speeds of 51.84M to 2.5G bit/sec — the equivalent of 48 T-3 links — and uses light pulses rather than electrical signals to transmit traffic.

"This SONET plan represents the next level of technical advancement for Sprint," said Mick McCarthy, senior vice president of Sprint's network division. "We've opened up our kimono to our competitors, but we think we're best positioned to deliver SONET first."

Although Sprint is the only one of the top four carriers with an all-fiber network, rivals AT&T, MCI Communications Corp. and WilTel have already installed SONET transmission systems in their long-distance networks.

The SONET project will require changes to equipment at the ends of each route and a move from high-end digital access and cross-connect systems (DACS) to SONET-compliant add/drop multiplexers.

The upgraded net will provide a twelvefold increase in network capacity, from 45M to 600M bit/sec on Sprint's main network routes, McCarthy said.

He declined, however, to say what kind of new network services the SONET links would enable it to offer to businesses, although he did say they will be used to offer asynchronous transfer mode (ATM) services, which are due out by year end.

Rather than take a large one-

(continued on page 28)

NTIA study to help Clinton develop telecom policy

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Sounding alarms that U.S. users may lose out in the global economic race unless the nation's regulators and legislators revamp policies on international telecommunications services, the NTIA last week kicked off a comprehensive examination of the market.

The National Telecommunications and Information Administration (NTIA) — the agency that advises the president on technology issues — said that while the U.S. has opened its market fairly broadly to foreign competitors, other countries have remained largely closed.

"The concept of private carriage . . . is not an option in the vast majority of other countries, [and] competition in the provision of international basic services is substantially limited except in a few instances," NTIA officials said.

Such disparities in the level of competition and pricing has caused the U.S. to run up a $4 billion deficit in telecommunications services. If this problem is not resolved, it may be necessary to revamp U.S. policies on telecommunications to ensure larger trade and policy goals are met.

NTIA officials said the timing of the market study is aimed at giving the new administration insights into the problem and allowing users to express their views to the incoming leaders.

"The notice does not commit the incoming administration," said George Chapados, assistant secretary at NTIA. "Rather, it should provide the information needed for the development of policy in a rapidly growing segment of the telecommunications industry."

One of the hottest areas of dispute currently is resale of international switched services over private lines. The Federal Com-

(continued on page 28)

Horst leads GSA into new network waters

After selling Philly office on SMDS, the GSA's computer specialist focuses on other agencies.

By Bob Wallace
Senior Editor

The U.S. General Services Administration's Bill Horst is trying to lead the federal government into the vanguard of networking.

Horst helped get the GSA's Philadelphia unit up and running as the first paying customer of Switched Multimegabit Data Service (SMDS), and now he's aggressively selling the advanced data networking service to other GSA offices across the nation.

In addition, Horst has helped found the SMDS user group for current and prospective SMDS customers and has also established the Federal Broadband Users Group.

Horst, a computer specialist, is something of a salesman for emerging technologies within the agency, having convinced the GSA to brave new network waters on several occasions. The key to his sales success is his ability to quickly become a subject-matter expert on a new technology and his refusal to take no for an answer.

"If I see a service I think the GSA can use to an advantage — be it to save money or facilitate network computing — I'll push it with great fervor," Horst said. "The key to success is convincing [others] that you are committed to a realistic vision."

Selling SMDS within GSA was more difficult than run-of-the-mill projects because Horst had to show a return and explain why the agency should take a chance on a new, untested service at a critical juncture — the relocation of the bulk of the office's staff to a different location.

While selling technology can be tough, Horst is also challenged to stay current with new technologies for internetworking LANs.

"A couple of years ago, the only viable option for linking local-area networks was dedicated lines," Horst said. "But the emergence of services like frame relay and SMDS has really changed the networking landscape.

"Although I've focused most of my efforts on linking LANs in metropolitan-area networks, my job is changing," Horst said. "I'm spending more and more time studying wide-area network options."

And that will likely intensify as he is presented with more wide-area offerings.

For example, Horst is researching Asynchronous Transfer Mode (ATM) but has heard more from equipment vendors than carriers — a situation he'd like to see changed.

"I think CPE vendors have done a pretty good job outlining how they plan to get to ATM," Horst said. "The [local] telcos have also talked about ATM. But the long-distance carriers haven't done much in this area."

This has frustrated Horst and other network managers involved in enterprise network

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Horst leads GSA into new network waters

continued from page 21

planning.

"I know it's hard to believe, but a good number of [carriers] and their switch providers haven't really thought too much about ATM and what it will mean to users like myself," Horst said.

He has turned to the various vendor forums for help, but has found that most vendors have representatives on the Frame Relay Forum, SMDS Interest Group and the ATM Forum. "It's next to impossible to determine what direction my [vendors and carriers] are headed in."

Worse still, Horst has found that the various organizations have few, if any, user members. "The vendors are starting to form approaches for their products but are doing so largely without user input."

Horst sees the Federal Broadband Users Group as the next logical step in the evolution of the high-speed switched data service.

"The goal is to have a group that would help network managers get a better feel for intra- and even interenterprise networking," Horst said.

He also sees a key role for the Federal SMDS Users Group, of which GSA would be a charter member, in the future of SMDS.

"It's crucial that we keep pace with new and advanced network services like SMDS," Horst said. "And we need to start talking about what carriers networks may look like in the not-too-distant future."

Horst believes emerging services such as SMDS could dramatically change the way users communicate with their business partners. In fact, SMDS was initially — and still is to some extent — pitched as an intercompany network service as opposed to frame relay, which is cast as an intracompany service.

"SMDS holds a lot of promise for communications between companies and their suppliers and customers," Horst said. "But it can be a real big challenge to get some [network managers] to look at SMDS as more than just another new service. And that's frightening."

Horst recommends that users partner with vendors to trial new products and service. "It's a tremendous learning experience, one which I would recommend to other users," Horst said. "Especially if you have little or nothing to risk by trying something new and different."

Horst got involved in the intricacies of LANs and internetworking almost from the start at GSA. Just six months into working with the agency in the mid-1980s, Horst saw the need to network personal computers. Agency employees all had microcomputers on their desks, but they were not linked in any way.

Horst examined the fledgling LAN technologies and, after some evaluation, analysis and cost studies, implemented the GSA's first LAN, a 3Com Corp. network.

As the LAN expanded, Horst became involved in internetworking, supplementing his experience with courses in LAN management, administration and network design.

Roughly two years ago, Horst and his GSA coworkers began planning what at first blush looked like a simple move from one building to a second site four to five blocks away.

"It was the move that got me involved with cabling design, structured wiring systems and CPE, like bridges and routers," Horst said. "When it got to the move, I started working on communications between the sites, which is where SMDS came into the picture."

Secret to success

Horst and the GSA worked closely with Bell Atlantic Corp. to make the SMDS installation a success. With SMDS running smoothly for the GSA's Philadelphia offices, Horst has set out to sell the service to other offices in New York and Boston, and will be involved in deciding what type of backbone net will be used to link the metropolitan-area networks.

"The best way to approach selling something new to people is to try to be as well informed about the subject as possible," Horst said. "I'll begin by explaining why I think a particular product or service will work. And ask for a chance to prove it."

Horst then takes a straightforward approach to handling questions. "I attempt to answer as many questions as possible. If I don't have an answer, I get back to them with an answer. But, if I'm flat-out stumped, I'll admit that."

Horst then follows by asking for a chance to prove that the equipment or service can work.

But, he added, "it doesn't hurt to have a few past success stories to help convince people to give you a chance. You can use them as examples and say 'you supported me on such-and-such project, and it worked, so stick with me on this one and it may work too.' "

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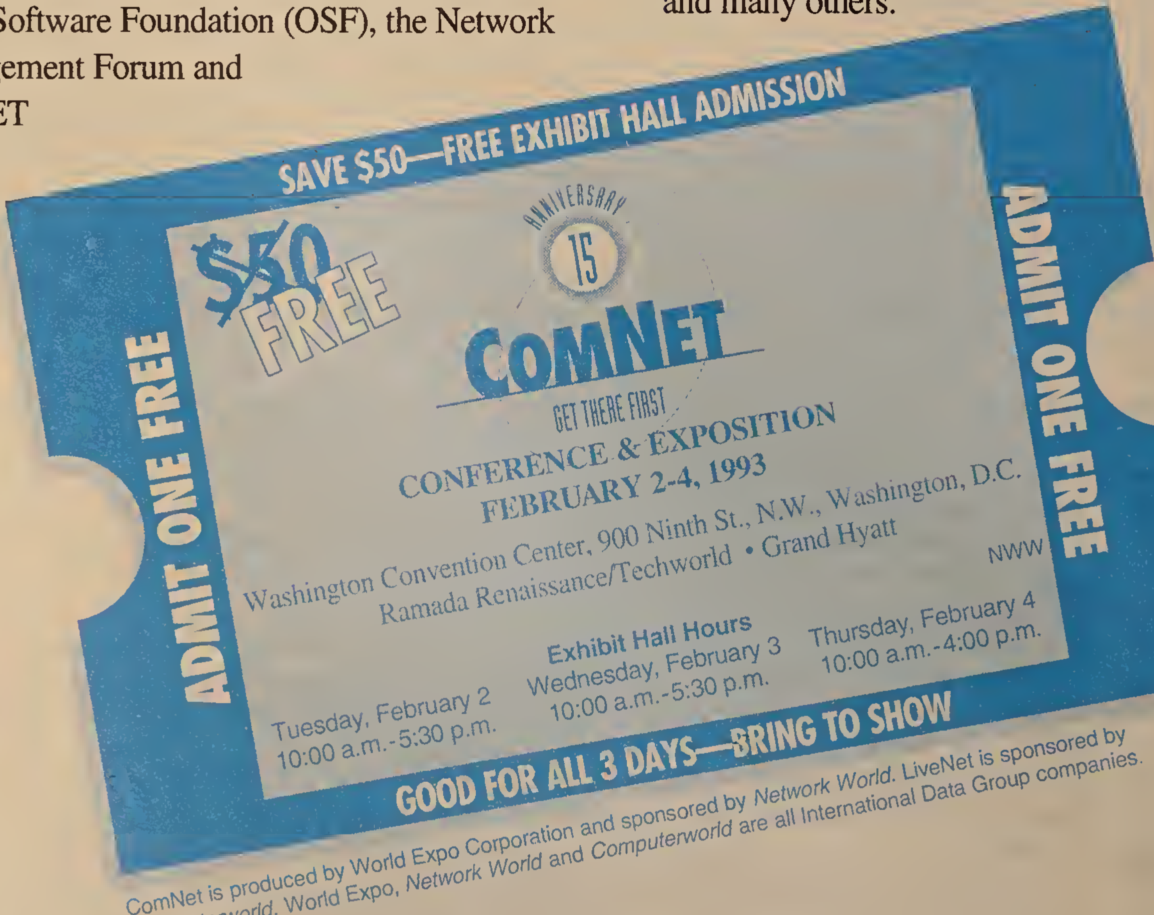

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Worth Noting

"Work group computing, which incorporates work flow routing, is the ultimate payoff for client/server computing."

Neal Hill
Senior analyst
Forrester Research, Inc.
Cambridge, Mass.

Store & Forward

Insoft, Inc. last week announced a new version of its desktop multimedia conferencing software that provides two-way, black-and-white videoconferencing across 56K bit/sec or Integrated Services Digital Network lines.

Previous versions supported 24-bit full-motion color video but required T-1 lines. The new version supports 4- or 7-bit gray scale video using Sun Microsystems, Inc.'s VideoPix board. The version also supports enhanced screen-sharing capabilities.

The software, which runs on Sun SPARCstations, costs $1,245 for a single-user version and is available now.

Chrysler Corp. recently recommended that internal units standardize on **Uniface Corp.**'s client/server applications development tool. The firm's Facilities and Materials Purchasing group gave Uniface's tool a "preferred" rating — the highest possible at Chrysler.

The evaluation measures the quality, delivery, price and technology of vendor products.

Chrysler is currently using Uniface to build several applications at its Technology Center in Michigan.

DataTools, Inc. recently

(continued on page 28)

Lotus Notes pack, cc:Mail gateways bow at NetWorld

Lotus teams with Isocor to build Notes software.

By Bob Brown and Wayne Eckerson
Network World Staff

BOSTON — Lotus Development Corp. used the recent NetWorld 93 show here to beef up the messaging capabilities of Lotus Notes and unveil several enhanced gateways for cc:Mail.

Lotus and Los Angeles-based messaging firm Isocor introduced a software package that enables Notes users to send and receive messages via public and private X.400 networks.

Isocor's X.400 Router for Lotus Notes runs on a personal computer running The Santa Cruz Operation, Inc. (SCO) Unix and sits in between Notes servers and X.400 nets. Using a technique called tunneling, the Notes router files Notes messages in X.400 envelopes and delivers them unchanged to Notes users or other electronic mail users with X.400 gateways, said David Knight, vice-president of marketing at Isocor.

Isocor plans to enhance the product to run on IBM's AIX and OS/2 2.X, Interactive/SunSoft, Inc.'s 386 Unix and Microsoft Corp.'s Windows NT. Isocor also plans to add CCITT X.500 directory services capabilities to the Notes router. The company is said to be working with Siemens AG on that, although Isocor would not comment.

The Notes router is based on an existing X.400 Isocor product dubbed the Isoplex 800 Message Server. But the new product includes a Notes module, a message store and other features. The basic Isoplex 800 Message Server also will be enhanced to support Microsoft's application program interface (API) (at INTEROP Spring),, Unix mail, cc:Mail and Microsoft Mail, among others.

Isocor's X.400 Router for Lotus Notes will be available in March and cost $8,950.

Besides the X.400 gateway, Lotus separately announced new versions of cc:Mail Router, cc:Mail Link to IBM's OfficeVision and Professional Office, and a gateway between Notes and cc:Mail, known as the High Fidelity Mail Exchange.

Version 4.0 of the cc:Mail Router adds support for several new network protocols, faster modem connections and new administrative capabilities. The product, which connects cc:Mail

(continued on page 28)

Firm grows its E-mail strategy

By Timothy O'Brien
West Coast Bureau Chief

SAN RAFAEL, Calif. — In a bid to compete in the growing multiplatform electronic mail market, Z Code Software last week announced it will port its Unix-based E-mail software to DOS, Microsoft Corp. Windows and Apple Computer, Inc. Macintosh platforms.

Since Z-Mail software supports the Transmission Control Protocol/Internet Protocol and Simple Mail Transport Protocol (SMTP) in Unix, the company believes its new strategy will let companies better integrate Unix and personal computer systems.

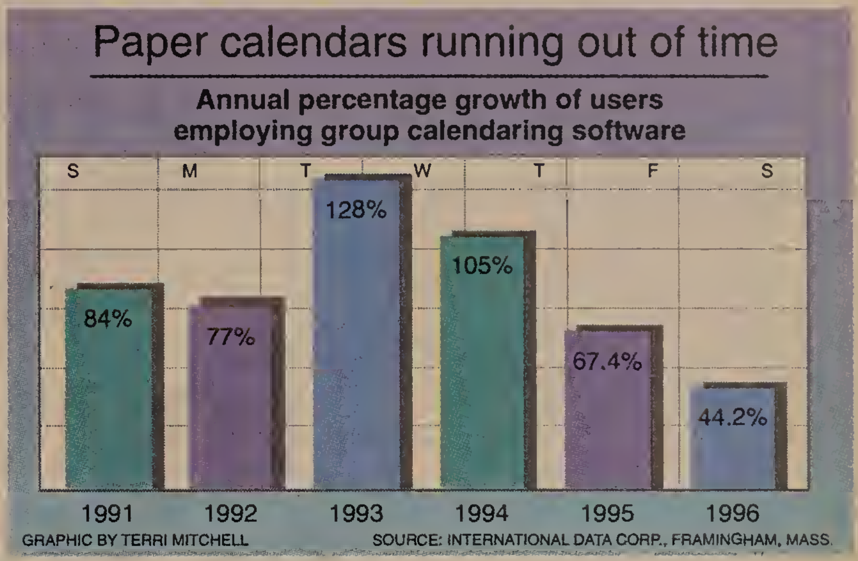
Z-Mail currently has versions that run on virtually every brand of Unix. It also supports Open Software Foundation, Inc.'s Motif and Sun Microsystems, Inc.'s Open Look graphical user interfaces.

Through the use of TCP/IP, it is possible with Z-Mail to use SMTP as a standard mail transport, eliminating the need for different types of gateways required in PC local-area network based E-mail systems.

The DOS version of Z-mail will be based on a product called Z-Mail Lite for Unix, which is a character display version that runs in Unix environments.

Porting efforts for all three platforms are under way. The DOS version should be available in the second quarter, while the Windows and Macintosh versions are set to be available in the fall.

Z-Mail Lite for DOS will be priced at $235 per user or $1,980 for a 10-user license. Pricing for the other platforms is not yet available. ◘


Paper calendars running out of time

Annual percentage growth of users employing group calendaring software

GRAPHIC BY TERRI MITCHELL

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

Group scheduling software takes off

Number of group calendaring users expected to climb as staffers try to coordinate schedules.

By Wayne Eckerson
Senior Editor

While group scheduling software has been around for several years, it's now on the verge of becoming a mainstream office productivity tool.

"Interest in group scheduling or calendaring has been simmering for several years, but now it's coming to full boil," said Ann Palermo, an analyst at International Data Corp. in Framingham, Mass.

Group scheduling software essentially scans workers' on-line personal calendars for mutually available free time, notifies participants of a proposed meeting and automatically updates their calendars if they decide to attend.

"Anyone who has tried to schedule a meeting among several busy professionals in different locations immediately recognizes the value of group scheduling software," Palermo said. "It's a real time saver."

Palermo projects that the number of group calendaring users will jump 128% this year to about two million people. Worldwide vendor revenues from group calendaring software will more than double from $23 million in 1992 to about $50 million this year.

The surge in demand is due partially to the large number of IBM Professonal Office System (PROFS) users that are being downsized to local-area network-based electronic mail systems, observers said. PROFS contains a scheduling component, and users are demanding that LAN E-mail vendors provide a similar capability.

In addition, Microsoft ignited the market this summer when it announced Schedule+, a Windows-based scheduling package that also comes bundled in Microsoft's Windows for Workgroups peer-to-peer LAN product. Microsoft's major competitors — IBM and Lotus Development Corp. — have been racing to define their group calendaring strategies and announce products.

According to analysts, Microsoft, Lotus and IBM will likely dominate the group scheduling market. But products from small established scheduling providers will do well if they run on multiple platforms — including DOS, Windows and Macintosh computers — and can support real-time calendar updates and searches across wide-area networks.

Two weeks ago at NetWorld 93 Boston, Lotus previewed a group scheduling product called Lotus Organizer which is based on a personal scheduling product it purchased from a U.K. firm last year. When shipped later this year, Lotus Organizer will run on Windows-based PCs and will work with any messaging system that supports the Vendor Independent Messaging (VIM) specification. Currently, cc:Mail and Notes support VIM.

IBM's group calendaring product, called IBM Scheduler, also debuted at NetWorld 93. The company expects to announce the product in the next few months. It runs on OS/2 servers,

(continued on page 28)

AT&T announces another inauguration in Washington this year.

Come see the inauguration of the first tariffed* nationally available Fractional T45 Service at this year's ComNet Show in Washington, D.C.

The swearing in of a new leader isn't the only exciting event going on right now in the nation's capital. Because the leader in business communications, AT&T, is debuting ACCUNET® Fractional T45 Service, to give your business a powerful competitive edge.

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS, ALLIANCES AND FINANCIALS

Worth Noting

Gupta Corp., a Menlo Park, Calif., vendor of client/server database products, and Powersoft Corp., a Burlington, Mass., vendor of client/server application development tools, have each filed initial public offering proposals with the Securities and Exchange Commission this month.

People & Positions

RAM Mobile Data, Inc. last week appointed **Charles Nahabedian,** formerly senior principal at systems integrator Technology Solutions Co. in Chicago, to vice president of corporate development.

Nahabedian, who had worked at AT&T Bell Laboratories on the first cordless telephone, will be responsible for RAM Mobile Data's corporate strategy, network management products and business development.

Infonet Services Corp. has appointed **Jean-Noel Moneton,** formerly executive vice president for product marketing, to vice president and general manager of its U.S. sales organization. Moneton will be responsible for all sales and customer support in the U.S.

John Millard, formerly senior vice president at NEC America, Inc., has been appointed president and chief executive officer of **Mitel Corp.,** a Kanata, Ont., vendor of business telecommunications systems. ◘

ISSC subsidiary brightens glum picture for Big Blue

IBM outsourcing group posts profit in hard times.

By Bob Brown
Senior Editor

TARRYTOWN, N.Y. — While 1992 was a year most IBM officials would rather forget, the company's two-year-old outsourcing business unit has plenty of cause for celebration.

IBM's Integrated Systems Solutions Corp. (ISSC) here has been on a roll, posting strong financials for 1992 and picking up a slew of new customers.

That's good news for IBM, which is counting heavily on its software and services business to pick up the slack left by its hardware business. Hardware sales fell from 57% of IBM's business in 1991 to 52% last year.

IBM last week reported revenue and earnings declines for its 1992 fourth quarter and full year compared to the same periods in 1991. IBM's 1992 revenue fell 0.4% to $64.52 billion from 1991's total, while fourth-quarter revenue dropped 11% from the previous year.

Faced with major restructuring charges to cover work force reductions and plant closings, IBM posted a $4.97 billion loss in 1992 and a loss of $5.46 billion in the fourth quarter.

The brighter side

While other sectors of IBM struggle, ISSC garnered about $1 billion in revenue and showed a profit in 1992, its first full year of operations. ISSC President Dennie Walsh has been named chairman and chief executive officer of the subsidiary, which is predicting 1993 revenue of $4 billion.

Fueling the growth were big outsourcing contracts signed by The Chase Manhattan Bank, N.A., retailer Hook-SupeRx, Inc., Kaiser Permanente, McDonnell Douglas Corp. and Norrell Corp., among others. The 10-year McDonnell Douglas deal is worth about $3 billion over that period, while the Kaiser Permanente deal is valued at roughly $70 million over 10 years.

ISSC has 37 enterprise network contracts in place and plans to grow that number this year.

While ISSC officials were not available for comment, analysts

(continued on page 28)

NET FINANCIALS

Banyan, Novell go Beyond. Beyond, Inc., a Cambridge, Mass., electronic mail application software vendor, last week announced that Banyan Systems, Inc. and Novell, Inc. were among the investors in the company's $6.6 million third round of financing. Banyan and Novell each invested $500,000 in Beyond. The funding will help the company's "market development efforts," said Chuck Digate, Beyond's chief executive officer.

Banyan and Beyond have worked together on various marketing and development projects for more than a year.

Wellfleet rolls on with Q2 financials. Wellfleet Communications, Inc., a Bedford, Mass., router vendor, reported revenue of $40.1 million for its second fiscal 1993 quarter ended Dec. 31, 1992, more than double its first fiscal 1992 quarter revenue. Earnings were $6 million, more than double the $2.6 million in second quarter fiscal 1992 earnings.

Borland hits skids in Q3. Borland International, Inc., a Scotts Valley, Calif., database software vendor, last week posted a $61.3 million loss for its fiscal 1992 third quarter ended Dec. 31, 1992, a reverse from the company's $7.5 million profit in the similar period the year before. The loss during the past quarter included a $25 million restructuring charge. Borland's revenue declined 9% to $104.3 million from last year's corresponding quarter. ◘

"Our goal is to have 80% of our work done electronically by the end of the fiscal year."

▲ ▲ ▲

Peg Arnold
Chief of the Government Acquisition Through Electronic Commerce Initiative team

Defense Dept.'s EDI project flying high

Air Force initiative saving money for agency but making bidding tough for some small suppliers.

By Ellen Messmer
Senior Correspondent

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — As the Air Force's electronic data interchange pilot takes off, it's creating greater competition in contracting.

Since October, officials at Wright-Patterson Air Force Base have been moving from reliance on the telephone and mail for supply purchases to an electronic bulletin-board system that vendors access to bid on posted items. The Air Force says the competition generated by the system is lowering prices, but some small businesses claim the cost of EDI will force them out of the race for Air Force business.

As the first pilot site for the Department of Defense Government Acquisition Through Electronic Commerce (GATEC) initiative, Wright-Patterson has set up the EDI prototype that may be adopted throughout the military for negotiation of "small purchases."

In Defense Department parlance, a small purchase is any order valued at $25,000 or less. More than 95% of all government purchase orders fall into this category, with only Wright-Patterson processing more than 50,000 separate small purchases yearly.

Suppliers that want to sell to the Air Force base must now subscribe to any of the six value-added networks (VAN) certified under GATEC (see chart, this page). The VANs are connected through a hub at Lawrence Livermore National Laboratory, the Defense Department's technical arm for the project.

Wright-Patterson posts request-for-quote (RFQ) information on an electronic bulletin board made available to the VANs. This list holds about 100 categories of items listed as RFQ "stock classes." The base no longer accepts written bids on seven of the stock classes and, by May, will be completely cut over to the EDI system, according to Peg Arnold, chief of the GATEC team here.

GATEC-participating VANs

- AT&T Easylink Services, Inc.
- Bell Atlantic Information Services, Inc.
- Datamatix, Inc.
- EDI*Able, Inc.
- Harbinger*EDI Services, Inc.
- Simplix, Inc.

SOURCE: WRIGHT-PATTERSON AIR FORCE BASE, DAYTON, OHIO
GRAPHIC BY TERRI MITCHELL

On Jan. 13, GATEC produced its 20,000th EDI transaction through the VAN hub.

"This level represents more than 275 transactions per day in terms of RFQs, purchase quotes and award summaries," Arnold said. If the military moves to adopt an idea under consideration — electronic funds transfer — the purchasing cycle will be fully electronic, she added.

Although the EDI procurement system has experienced few technical glitches, some companies complain it doesn't work for

(continued on page 28)

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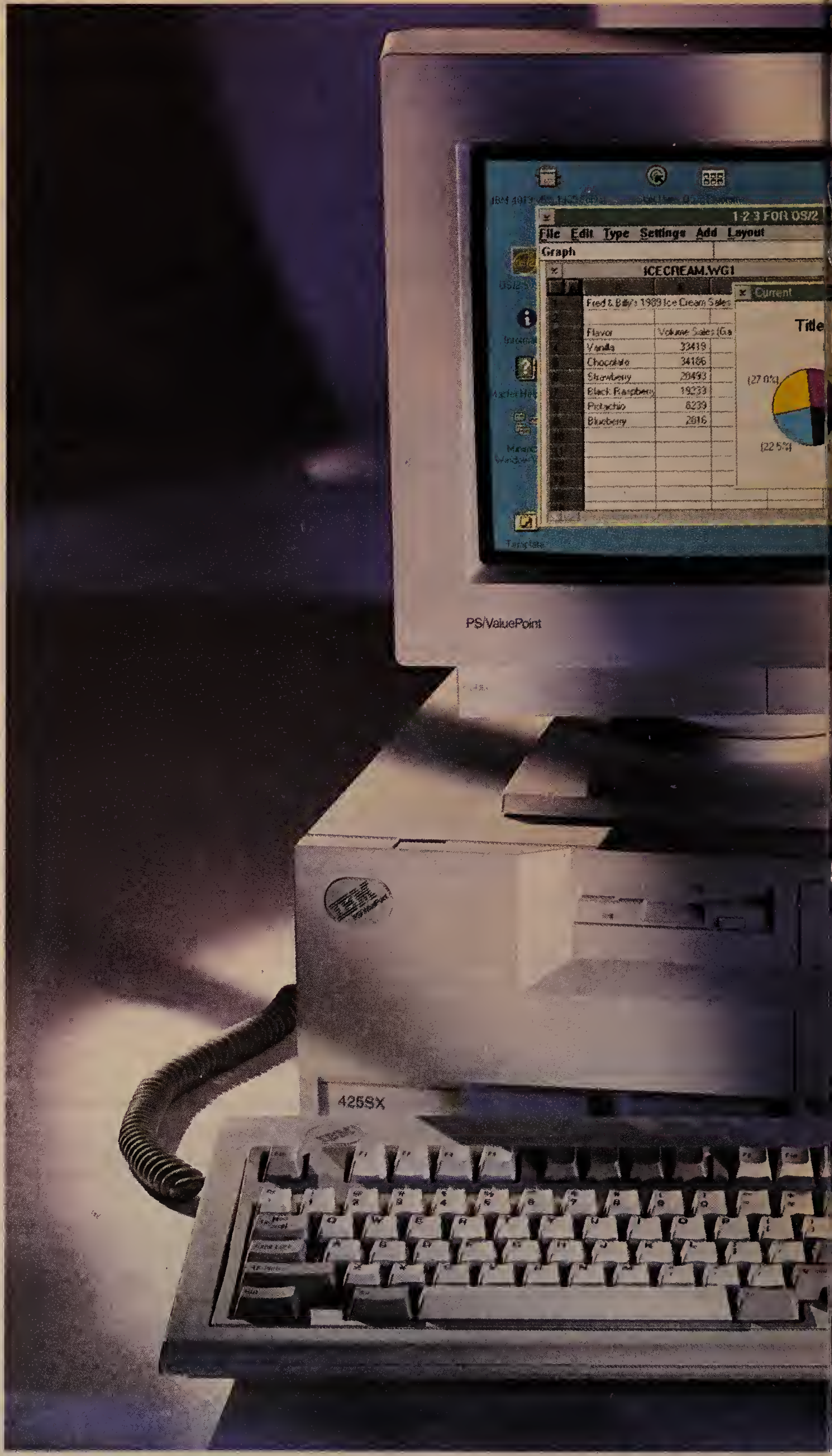

†*Models 425 SX and 433 DX are shown with the PS/ValuePoint 6314 Color Monitor.*

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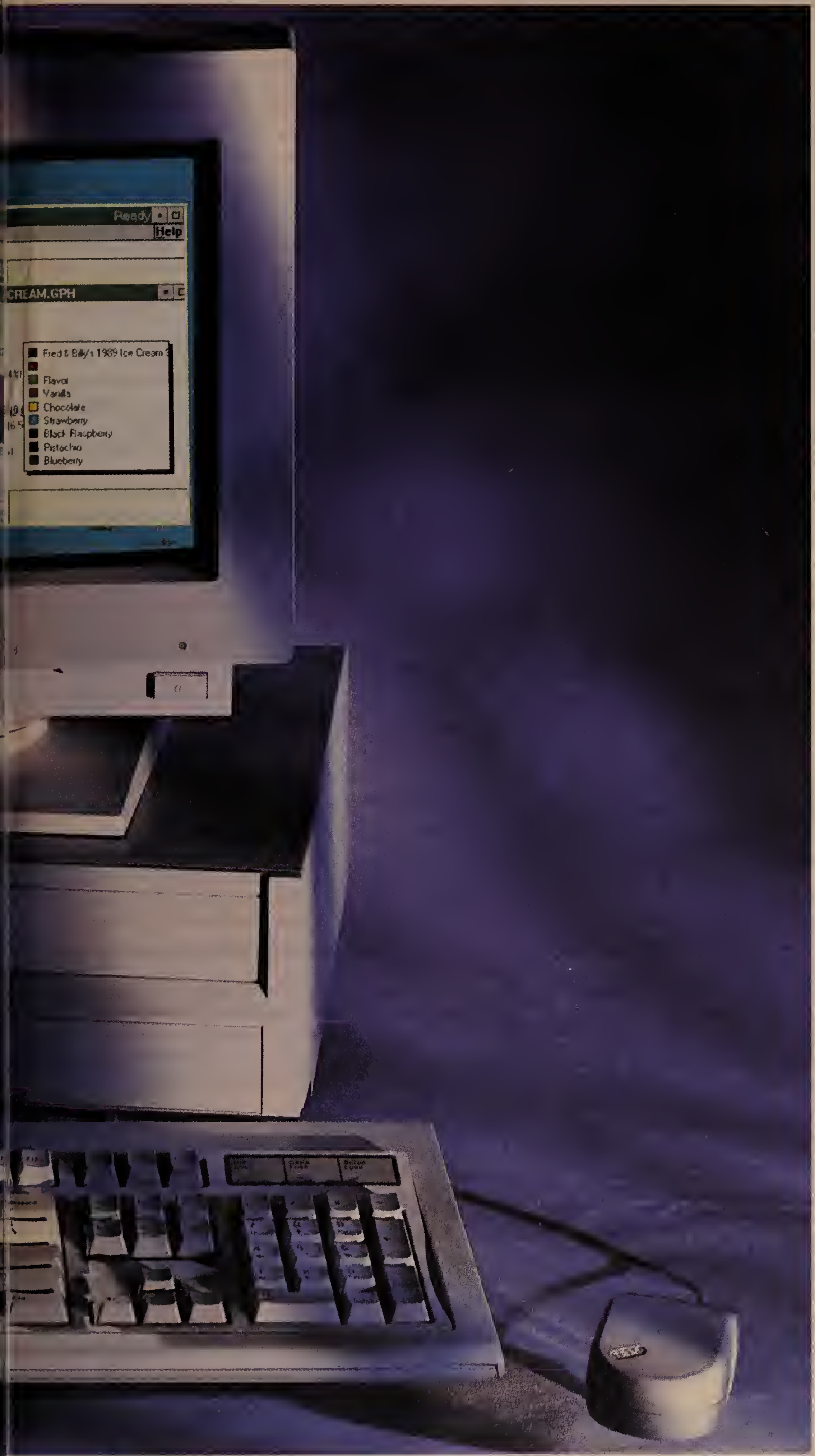

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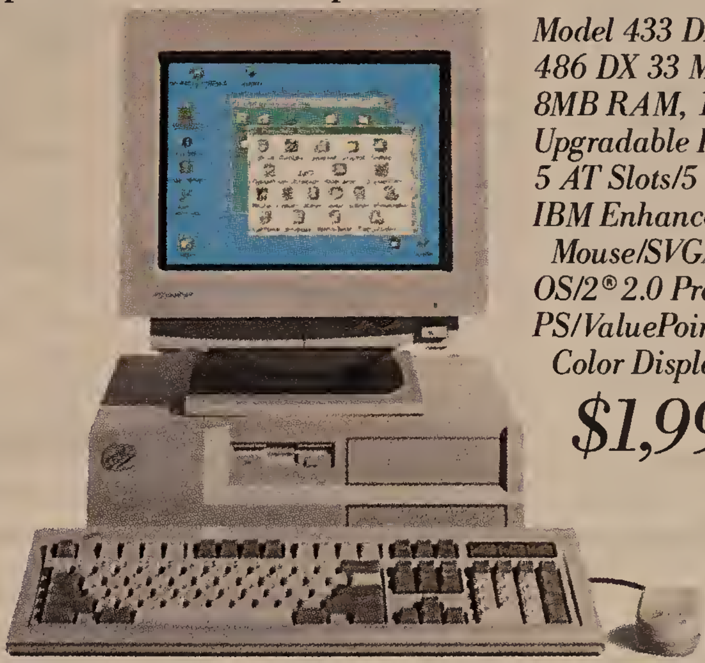

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Unit brightens glum picture

continued from page 25

said IBM is leveraging its strong ties with big companies.

"ISSC is winning these outsourcing contracts thanks to the long-standing relationships IBM has built up with customers over the years and the IBM brand name, something that companies like [Electronic Data Systems Corp.] don't have," said Ray Manganelli, president of Gateway Information Services, Inc., a New York-based consulting firm.

Julie Schwartz, associate director of professional services at Dataquest, Inc. in Framingham, Mass., said ISSC has had to prove its credibility to users and has done so. Eastman Kodak Co. was quite skeptical about IBM when it signed a landmark outsourcing deal in the late 1980s, she said.

ISSC's credibility among users improved markedly last year when IBM and Sears, Roebuck & Co. announced their Advantis network services joint venture, which will be run largely by ISSC, Schwartz added.

In an effort to keep its momentum going, ISSC will increase the number of vertical markets it targets from 11 to 16. Samuel Palmisano, a top IBM official overseeing Asia-Pacific operations, has been named ISSC's president with responsibility for vertical market efforts.

In addition to its outsourcing offerings, ISSC provides systems integration, consulting, application software development, disaster recovery and other services.

Lotus unveils wares at NetWorld

continued from page 23

post offices on the same or different LANs, now supports Novell, Inc.'s Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX), Banyan Systems, Inc.'s Sequenced Packet Protocol and IBM's Advanced Peer-to-Peer Communications protocols. The router previously supported Transmission Control Protocol/Internet Protocol, X.25 and Integrated Services Digital Networking protocols.

Version 4.0 also supports modems that run at 14.4K bit/sec and serial connections up to 115.2K bit/sec. The product lets administrators schedule specific times for sending directory updates, concentrate updates into a single message and forward error messages to a remote administrator, among other things. CC:Mail Router 4.0 will be available later this month for $1,295.

Lotus' cc:Mail Link Version 3.0 adds support for transparent interconnection between cc:Mail and OfficeVision/VM users and the ability to send messages to multiple nodes via a single cc:Mail post office or OfficeVision node, among other things. Available now, the gateway costs $7,995.

Version 2.0 of Lotus' High Fidelity Mail Exchange supports directory synchronization between Notes and cc:Mail and lets users transfer messages and documents between Notes and cc:Mail without losing special formatting and fonts within those documents. The gateway, which shipped in November, transfers a Notes compound document as a cc:Mail message with multiple attachments.

Sprint issues equipment RFP

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time writedown for the replacement of the DACS and other related components, Sprint will depreciate and replace the existing network equipment over several years, McCarthy said.

Sprint is scheduled to have completed the upgrade to the SONET transmission systems by 2003, McCarthy said.

"It's a major undertaking, so we're taking the whole thing gradually," he said.

Sprint already has some experience with SONET equipment. In late 1991, the carrier installed MetroNet, an 18-node Optical Carrier (OC)-12 and OC-48 network, to serve sites in the Kansas City area.

In addition, the carrier is testing SONET equipment from suppliers including AT&T Network Systems, Northern Telecom, Inc. and Fujitsu Network Systems ("Sprint execs detail plans for emerging technologies," *NW*, Sept. 21, 1992).

Sprint will announce one or more equipment providers by the end of June.

Study to help develop policy

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munications Commission has adopted rules that allow foreign carriers to place switches in the U.S. to collect switched traffic and carry it over private lines to other countries as long as equivalent opportunities exist for U.S. resellers in that country.

Recently, two foreign resellers have applied for permission to begin such resale operations, but AT&T and other companies question whether the FCC looked hard enough to determine whether resale opportunities are equivalent. Questions such as this will be addressed in the NTIA's study and could lead to a substantial revamping of U.S. telecommunications policies.

EDI project flying high

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them. "If they want to do business with small businesses, they'll have to refine the system a little bit," said Brooks McCallister, president of Ken McCallister, Inc., an art material dealer in Dayton, Ohio, that has sold its goods to Wright-Patterson for 40 years.

Under the current GATEC system, McCallister must download large amounts of procurement information that is irrelevant to his company, McCallister said. He urged Wright-Patterson to create more stock categories so companies only have to pull down the information they need.

McCallister, a subscriber to Bell Atlantic Information Services, Inc.'s IntelliTrade EDI Services, pays a $20 monthly charge as well as 2 cents per 100 characters of information downloaded, in addition to the cost of a separate phone line and long-distance charges. The firm is facing a 25-fold increase in costs over the old system of mail and a phone call, McCallister said, adding that he isn't sure his company will be able to keep doing business with Wright-Patterson.

Arnold responded by saying Wright-Patterson is willing to alter the GATEC system but change will take time.

However, another small business and IntelliTrade customer, Miami Computer Supply, Inc., feels the GATEC system is effective. Joe Sullivan, MIS coordinator for Miami Computer Supply, said GATEC gives his company a shot at procurements it might have missed, although the competition appears tougher now.

Sullivan praised Bell Atlantic's service, noting that when Wright-Patterson failed to receive his company's RFQ bids on a few occasions, Bell Atlantic took responsibility for the problem and offered to compensate the firm. "They've gone beyond most vendors in their support," he said.

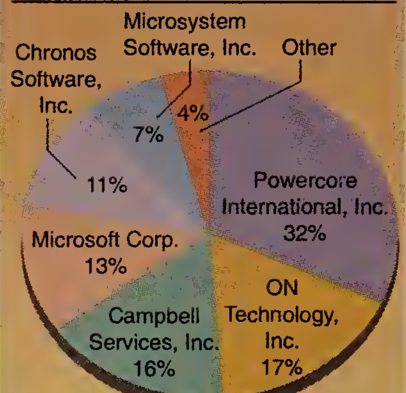
New software takes off

continued from page 23

and Windows and OS/2 clients, and also supports VIM.

One of Europe's leading E-mail providers, Finansa, Ltd. of London, which makes WinMail, last month merged with the world's largest provider of scheduling software, Powercore, Inc. of Manteno, Ill. The new company, Powercore International, plans to integrate its E-mail and scheduling products, which both run on DOS and Windows platforms, while still offering them as stand-alone products.

Group calendaring market share



1992 vendor revenues for group calendaring software as percentage of total industry sales

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.
GRAPHIC BY TERRI MITCHELL

"Two years ago, we realized scheduling was going to be a critical component of all successful LAN-based E-mail systems," said Gavin Whichello, president and chief executive offer of Finansa. "That's when we began looking for potential partners with expertise in scheduling."

Rather than integrate its product with any one scheduling tool, E-mail vendor Beyond, Inc. of Cambridge, Mass., has decided to establish interfaces with third-party scheduling products. Early this month, it announced BeyondMail interfaces to Campbell Services, Inc.'s On Time and Microsystem Software, Inc.'s CaLANdar products.

"We believe customers ought to be able to choose from any number of scheduling packages on the market today," said Chuck Digate, president of Beyond.

Other vendors, such as WordPerfect Corp. and Futurus Corp., have integrated scheduling into their office groupware packages. WordPerfect's Office 4.0 provides integrated messaging, scheduling and work flow capabilities.

This fully integrated approach avoids the problems of trying to synchronize multiple directories and connecting scheduling and E-mail products through interfaces or gateways that tend to minimize product functionality.

Store & Forward

continued from page 23

announced a back-up and recovery utility for Sybase, Inc. databases, called SQL-BackTrack for Sybase.

Besides supporting physical backups of data, the tool allows users to back up individual objects or groups of interdependent objects that are critical to a company's operation.

This capability enables administrators to restore only the data needed to run specific operations, accelerating restoral speeds.

In addition, it allows multiple databases to be backed up to the same tape or optical disk, which improves performance.

Available this quarter on Sun Microsystems, Inc. and IBM Unix processors, SQL-BackTrack costs $5,195.

Cognos Corp. of Burlington, Mass., last week announced a new version of its decision support system, called PowerPlay 3.0, that runs on Unix servers from most leading vendors, including Sun Microsystems, Inc. and IBM.

The software also supports enhanced drill-down capabilities, an improved user interface and Microsoft Corp.'s Object Linking and Embedding technology.

Available now, PowerPlay 3.0 costs $695 per copy and between $1,995 to $7,500 for connections to Unix servers.

FileNet Corp. of Costa Mesa, Calif., last week stated that it is shipping software that allows users to manage and navigate large document folders and annotate documents in those folders.

Called FolderView, the software supports an interface that can be easily customizable to support different work flow processes.

FolderView costs $795 per workstation.

Start-up **Simplify** of Nashua, N.H., recently unveiled a Windows-based document and image management system that makes images easier to capture, route and view, according to company officials.

MailRoom, which runs on a Novell, Inc. NetWare 3.11 local-area network, converts any document into Simplify's UniDoc image format.

From there, the document can be filed, edited, faxed or routed via electronic mail to other net users.

Available the second quarter of this year, MailRoom will cost $995 for a 10-user license.

MANAGEMENT STRATEGIES

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Worth Noting

"When you make major changes in this industry, you tend to run into major walls."

Douglas Spreng
Vice president and general manager
Network Adapter Division
3Com Corp.
Santa Clara, Calif.

Manager Minutes

The **Tele-Communications Association (TCA)** announced that Dugal Easton has begun his term as corporate president of the group and that it has elected its board of directors for 1993.

Easton, who is administrator of utilities and telecommunications for Seattle School District #5, said his goal for the TCA is to expand its membership while maintaining its unbiased independent view of the telecommunications industry.

The new board of directors includes Robert Hamilton from Hewlett-Packard Co., who will act as chairman. Also, Joan Hinson of John C. Lincoln Hospital, will represent the Arizona chapter; Steven Archer of HP will represent the Colorado chapter; Janice Wong of American Honda Motor Co. will represent Los Angeles; Susan Nicely of Miles & Stockbridge will represent Maryland; Edward Alf of Fluor Daniel, Inc. will represent the Orange County chapter; Sandra Latham of U.S. Bancorp will represent Oregon; Bryan Agnew of Simpson Timber Co. will represent the Puget Sound chapter; Patricia Fuller of the State of California will represent the Sacramento Valley chapter; and Don Collier of Fujitsu America. Inc. will represent the San Francisco Bay Area chapter.

For more information about the association, call (818) 967-9411.

"With the proliferation of [network software and equipment] offerings comes choice. But with choice, there's work. You really have to know what you're doing."

▲ ▲ ▲

Elaine Bond
President
Open User Recommended Solutions

OURS looks to ease task of multivendor net mgmt.

Charters 4 task groups to deal with top issues.

By Joanne Cummings
Senior Writer

BOSTON — Open User Recommended Solutions (OURS), a user advocacy group, used the recent NetWorld 93 show here to issue the first of a series of white papers aimed at helping users more easily manage multivendor network environments.

Elaine Bond, president of OURS, announced the white paper on software licensing and detailed three other OURS task forces during her keynote address at the show.

She said users today do not have the proper tools for managing multivendor nets. "[Information systems] is evolving to the point where it will deliver information to anyone at any time in any place and on any subject," Bond said. "We need to evolve with it."

Multivendor network environments face several problems, she said. Managers are faced with tracking multiple vendors and suppliers, dealing with lagging standards and islands of automation, supporting legacy systems and managing staff with fragmented skill sets.

The solution to these problems is cooperation, especially among vendors, Bond said. "Vendors must realize that if they get all the players working together to solve user needs, the market pie will grow," she said. "And they need to deliver these solutions more cost-effectively."

Bond said OURS has chartered four task groups to deal with vendors and ease multivendor environment management.

The first task group, dealing with software licensing, issued the white paper, which looks at how licensing is handled today and offers several models to fit the ways users utilize software.

For example, the paper said site licensing tends to be more cost-effective for companies that utilize many stand-alone applications, such as word processing, whereas firms that utilize distributed applications such as database software might consider concurrent licensing.

OURS issued a request for comment on the paper and hopes to have a final draft ready for its next meeting in March.

Another OURS task force is addressing education in a multivendor environment. Today, product education is primarily vendor-specific, and users with multivendor environments find they need to attend too many redundant training classes. In March; the task force plans to issue a white paper on education that will look at ways to offer multivendor training.

Another task force is examining security, Bond said. With so many systems running together, users have multiple passwords, which are difficult to remember and track. This task force is looking at ways of allowing single sign-ons in multivendor nets.

The last OURS task force is evaluating how to convince vendors to inform users not only about their own products, but also about other vendors' products with which their products work. According to Bond, OURS is building a prototype database that would enable users to view lists of products along with other products with which they interoperate.

INSIDE THE INTERNET

BY ED KROL

A look at client/server on the Internet

I began my association with the Internet in 1985, when I was given the task of connecting the National Center for Supercomputer Applications at the University of Illinois to the Internet.

In those days, you were lucky if you could get electronic mail through, let alone maintain a high-quality connection suitable for interactive client/server applications. But the Internet eventually got more reliable, and real people started using it for real work.

I'm still at the university, but I now head a group deploying 10,000 Internet-accessible local-area network connections to every faculty and staff work area — fertile ground for client/server computing.

Today, client/server is a hot topic, but the kind of client/server computing I see frequently on the Internet is rarely discussed. The typical client/server application is private work sharing, where an application exists on a mainframe that it has been running on for years. Tools have come along that allow that same application to be split into pieces. The user interface gets moved to the person's workstation and is upgraded to a graphical user interface, while the back-end processing stays on the mainframe.

The user, who frequently does not know that cooperative processing is occurring, wins because the interface is more responsive and easier to use. The data center wins because users are happier and some of the work load has been foisted off onto the user machine.

In this scenario, clients and servers work together in a closely administered world of who can do what for whom. Each client machine or user is individually authorized to access certain services, which it uses almost exclusively.

Internet users have always known about clients because they have had to install them on their computers to execute the simplest tasks. For example, if you wanted to log on to another computer, you had to have a Telnet client; if you wanted to move a file, you needed the File Transfer Protocol client.

You had to tell these clients what server you wanted to use, and sometimes, you needed a preexisting account on that server.

But as the Internet attracts more neophyte users, simpler user-oriented applications and their clients have started to appear. With these new applications, users do not have to put in server addresses or prior authorization in order to use them. Clients come configured to find at least one server.

Once the initial server is contacted, it tells the client which server to contact next to resolve the user's problem.

In the predominant type of client/server computing on the Internet, clients are not tied to any one server, and there is usually no prior authorization or table of valid clients. Clients are free to move from server to server as necessary to provide the service required.

Since the purpose of this column is to get the network professional up to speed on what is available on the Internet, I thought it was important to emphasize that paradigm shift at the outset. In future columns, I'll discuss three common Inter-applications that support this kind of client/server computing: GOPHER, a menu-based resource location and delivery system; WAIS, a full-text searching tool; and World Wide Web, a hypertext tool for finding and displaying information.

Krol is assistant director for LAN deployment at the University of Illinois in Urbana-Champaign and author of The Whole Internet User's Guide & Catalog *(Sebastopol, Calif.: O'Reilly & Associates, 1992). He can be reached at e-krol@uiuc.edu.*

THE TRANSITION

BY ALAN PEARCE

Clinton-Gore drafting team of policymakers

Communications policy-making will be a high priority in the new administration of President Bill Clinton and Vice President Al Gore. Both know and understand the importance the communications industry will play in the economic, political and social future of the U.S. as well as the rest of the world.

The Clinton administration will quickly put its people in place at the Federal Communications Commission and the National Telecommunications and Information Administration (NTIA). The current front-runner to replace Al Sikes as FCC chairman is litigator Reed Hundt, a close friend of Gore. Others in the running are Toni Cook, chief counsel to the Senate Communications Subcommittee, Sharon Nelson of the Washington Public Utilities Commission (PUC), Steve Hewlett of the Tennessee PUC and Lew Paper, a friend of Clinton. The administration must also appoint an FCC commissioner to replace Sherrie Marshall and some senior FCC staff.

The top tip to head the NTIA is Richard Neustadt, a former Jimmy Carter White House aide and a longtime Clinton-Gore supporter. Other contenders include Toni Cook; David Leach, an aide to Rep. John Dingell (D-Mich.); and House Telecommunications Subcommittee staffers Gerry Waldron and Larry Irving.

The leaders put in place by the Clinton administration will have many key policy issues to decide and actions to take. The FCC will likely urge, or perhaps compel, local carriers to more rapidly deploy narrowband Integrated Services Digital Network; move toward deployment of broadband ISDN; determine methods for interconnecting networks; establish rules for internetwork switching; and examine improved network architectures.

Another key issue is deciding whether to unleash the regional Bell holding companies. It's likely that the Clinton-Gore team will work vigorously to get the RBHCs into new lines of business, including cable television, equipment manufacturing and, ultimately, long-haul services.

These policymakers will also need to work with Congress to rewrite the Communications Act of 1934 to more clearly define where federal jurisdiction over carriers ends and state jurisdiction begins. Recent events show that the Communications Act is out of touch with today's technological and competitive realities. Advisors to the new administration say the last straw came when a Washington, D.C. appeals court recently overruled the FCC's forbearance doctrine by which the FCC had applied less rigorous regulation to nondominant long-haul carriers. This setback implies that the FCC does not have the authority under the act to relax regulatory pressure on firms calling themselves local or long-haul common carriers.

Overall, Clinton's communications policymakers face a full agenda. But they will have top-level support. Gore has been involved in communications policy-making since his first election to Congress in 1976 and will remain close to the scene with the help of two top aides, Roy Neel and Mike Nelson. ◘

Pearce is president of Information Age Economics, Inc., a telecommunications research firm in Washington, D.C. He can be reached at (301) 320-3608.

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EDITORIAL

Bush administration's E-mail exploits send powerful message

The Bush administration's legal wranglings over electronic mail serve as a good reminder that all organizations need a clear-cut policy on the use of the technology.

The White House E-mail woes stemmed from the long-running Iran-Contra investigation. The Bush administration had planned to purge White House and National Security Administration computer files and archived E-mail prior to the Clinton inauguration. That spurred a head-to-head clash with a federal judge who twice ordered the administration to save the electronic documents, which some experts feel may contain valuable information about Iran-Contra events.

It isn't surprising that the controversy over E-mail has extended to the highest level of government. E-mail has become an increasingly vital underpinning of organizational life, and a growing number of companies are wrestling with issues of E-mail privacy, security and abuse.

Three years ago, the landmark E-mail privacy case filed by employees of Epson America, Inc. raised a call for companies to institute policies regarding E-mail usage.

The furor over that case and a 1991 case involving Nissan Motor Corp. USA has died down. But have users benefited from those legal lessons? Has your company drafted and disseminated an E-mail policy? If not, you're opening yourself up to the potential for costly abuse of electronic communications facilities and legal problems.

E-mail experts say companies must make clear to employees whether messages will remain private or be monitored. Experts also say employers should let it be known how the company will deal with inappropriate, criminal or excessive use of E-mail facilities.

Drafting an E-mail policy shouldn't be difficult. Organizations like the Arlington, Va.-based Electronic Mail Association can offer plenty of guidance. But the point is that companies need to act now.

As one lawyer pointed out, "If you inform people from the very beginning about privacy issues, I would have no lawsuits." ◘

REALITY CHECK

BY THOMAS NOLLE

Users and vendors need another view of video

Everybody thinks videoconferencing will advance to the desktop, where it will become a great consumer of bandwidth and a revolutionizer of business practices. In reality, we're about to cut the heart out of the video revolution by betting on delivery technologies so expensive that only an elite few will be able to cost-justify video to the desktop.

These new technologies, such as Asynchronous Transfer Mode (ATM) and Fiber Distributed Data Interface II, overcome video's intolerance for transmission delay. Today, video typically requires a high-bandwidth, point-to-point connection and low delay.

To make video easier to cost-justify, video coder/decoder vendors are reducing bandwidth requirements by adopting compression standards such as CCITT's H.261, which lets users transmit video over multiple 64K bit/sec circuits. Low-delay transmission typically requires an isochronous channel, which offers a constant bit rate (CBR) similar to a circuit-switched link.

The problem is that we don't quite have a CBR service to the desktop. Instead, we have local-area networks that use packet-oriented data protocols, which cannot provide a CBR. Consequently, we can transmit H.261-based video over point-to-point links but not across a local-area network.

Of course, vendors have answers for this problem. ATM, FDDI II or other LANs providing an isochronous channel, such as the isochronous Ethernet plan IBM and National Semiconductor Corp. submitted to the IEEE 802.9 committee could provide a LAN-based CBR service.

But implementing any of these technologies will require new hubs and LAN adapters. At an optimistically low price of $1,000 per adapter for any of these new LAN alternatives, it would cost billions of dollars to outfit clients to support video.

The assumption that users will spend so much is crazy. There are still users running IBM's original broadband-based PC Network and Novell, Inc.'s NetWare 2.X. These users are going to spend billions of dollars to outfit their LANs for video?

> These users are going to spend billions of dollars to outfit their LANs for video?
>
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The only way to make video to the desktop real is to create a standard for transmitting video using packet protocols. That was the goal of the Packet Video Workshop, which met in December at the University of North Carolina (UNC). At the meeting, UNC presented its Media Transport Protocol (MTP), designed to enable the Internet Protocol to carry video and audio. MTP showed that it is possible to provide a network service with delay and error rates that video can tolerate.

Separately, Cornell University in Ithaca, N.Y., demonstrated a packet video application that combines an Apple Computer, Inc. Macintosh with an inexpensive camera and video frame grabber. Performance was less than perfect, but a protocol such as MTP and very large-scale integration chip-based packet video compression could improve it substantially.

Admittedly, packet video has its problems. Some early implementations make those appearing on screen look like ghosts caught in a strobe light. But most of these implementations involve full-screen display and include rapidly moving objects.

Desktop video will likely involve small display windows with talking heads that don't move much. Motion-sensitive video compression should be able to provide good image quality in quarter-screen windows and, thus, support the video applications most users will require.

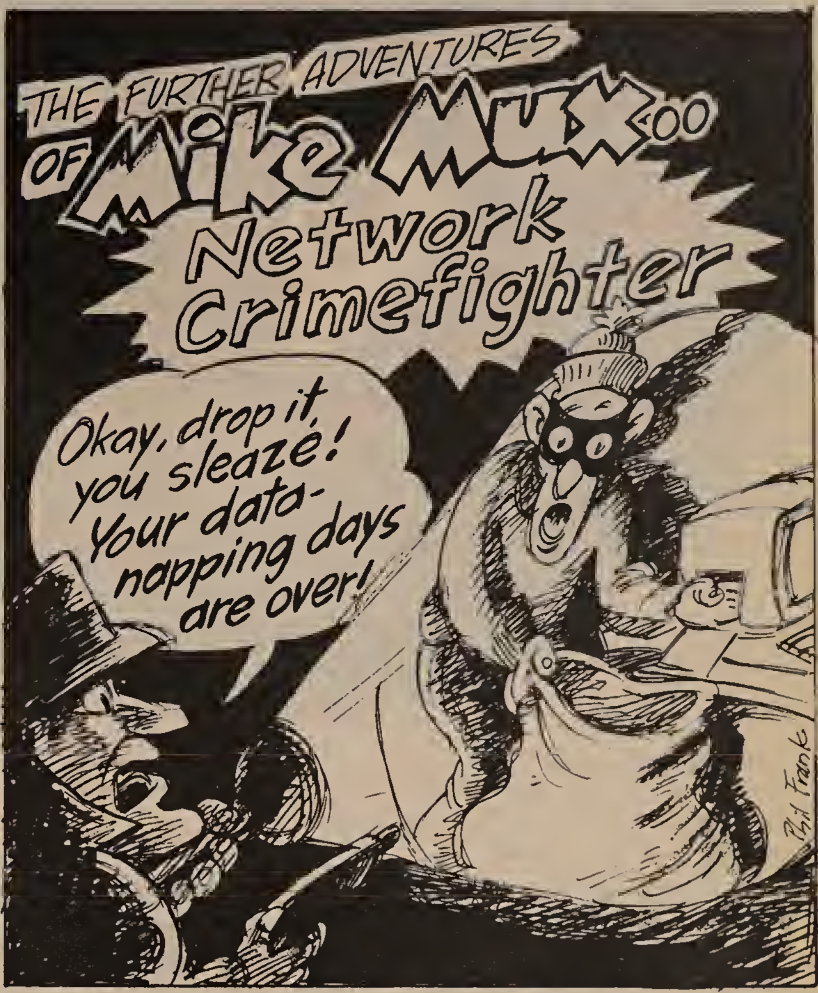
With a packet video protocol, users will have several alternatives. If they want to start from scratch, H.261 and isochronous LANs will do. If they want to limit video to a single-site LAN and are willing to star-wire desktop devices to a hub, MTP might be the solution. But if users expect to send video over wide areas or want to further reduce the impact of video on the LAN infrastructure, we will need enhanced packet video coding and video transport standards for LANs, and we'll need to pressure vendors to provide them.

We're at a video crossroads. We can keep pushing CBR-dependent video transmission and forget about implementing multimedia applications, or we can encourage more research on a packet video codec that could save literally billions of dollars in LAN infrastructure changes and the concept of video to the desktop at the same time. ◼

Nolle is president of CIMI Corp., a technology assessment firm located in Voorhees, N.J. He can be reached at (609) 753-0004.

TELETOONS

BY FRANK AND TROISE


THE FURTHER ADVENTURES OF Mike Mux 00 Network Crimefighter
Okay, drop it, you sleaze! Your data-napping days are over!
Bill Frank

LETTERS

We were first

A brief in your Enterprise Applications section ("Store & Forward," Dec. 14, 1992) stated that NCR Corp. and Cincinnati Bell Information Systems, Inc. have developed the first Unix-based system for capturing images of checks. This is clearly an exaggerated claim.

We at IA Corp. developed a Unix-based check-image capture system that has been in use at Fidelity Investments for over 18 months. About six months ago, we extended the system to support check-image transmission from Fidelity's new processing bank, United Missouri Bank. We believe that makes us the first vendor to deliver — not merely announce — a Unix-based check-imaging solution.

Nat D. Natraj
Director
Strategic Planning
and Business Development
IA Corp.
Alameda, Calif.

Editor's note: NCR claims its product is the first high-performance Unix-based imaging system designed for the banking industry. But IA Corp. has indeed had a Unix-based imaging system on the market for some time. We regret any misunderstanding.

E-mail test rings true

Your front page article about E-mail interoperability ("E-mail test sends message of interoperability woes," Jan. 11) rings true.

We attach great hopes to Internet Engineering Task Force's Multipurpose Internet Mail Extensions standard. A freeware personal computer mail user agent (MUA) is now available, and commercial alternatives are also becoming available.

Craig Paul
WAN specialist
Computer center
Kansas University
Lawrence, Kan.

Want to respond to an article or opinion in Network World? *Mail typed letters to Editor,* Network World, *161 Worcester Road, Framingham, Mass. 01701, or fax them to (508) 820-3467. Transmit your response via MCI Mail at 390-4868 or to our Bulletin Board System. (See page 2 for BBS instructions.) Letters may be edited for space and clarity.*

HELP IS ON THE WAY! If you have a question regarding a product, service or technical problem, submit it to our Network Help Desk. We'll contact vendors, network integrators, consultants and other experts to get an answer for you.

You may submit questions to Susan Collins, associate features editor, by calling (800) 622-1108, via fax at (508) 820-3467, or via *Network World*'s bulletin board (see logon instructions, page 2).

FAX SERVERS

Fax servers send a cost-effective message

While making it a breeze to send faxes from a computer, fax servers falter in routing incoming faxes to users.

By PETER DAVIDSON

Users thinking of installing a fax server today are caught in a quandary. On one hand, they're excited about the benefits of faxing documents or graphics from their workstations, instead of printing them out first and standing in line at the facsimile machine.

On the other hand, they realize few fax servers have viable options for automatically routing incoming faxes to a user's workstation. Instead, most fax servers today either print incoming faxes on a network printer or facsimile machine. Some users store received faxes as computer files that must be manually routed over the network by a fax server operator.

"There's an inbound routing problem," says Anthony Veit, business systems group manager at Booth Newspapers, Inc.

Because of this inbound routing problem, Veit and other users have put off buying a fax server, and it may take as long as a decade for the technology that will change their minds to appear (see "Automatic inbound routing options emerge," page 33).

Even with inbound routing, faxed images are often displayed on the workstation screen exactly the way they were received. So if the image was off-center or upside down when received, that is the way the end user will see it. A further complication is that many images don't fit on the workstation screen, forcing users to scroll through the screen in order to see the entire image.

"There's no good way to read faxes on a personal computer screen when they come in skewed," Veit says. "We still haven't seen the right solution."

But several current users echo an often-heard vendor claim that 80% to 90% of faxes start out as computer files. The graphic on page 37 shows that a department sending 50,000 fax pages annually can save $10,000 during that time in reduced wages by directly faxing the 80% of facsimiles that are available as computer files. This suggests that a $2,000 fax server can be cost-justified in a few months and that soft savings are considered a legitimate cost-justification factor. So even without routing incoming faxes, these figures suggest that fax servers can provide real benefits.

The savings indicated in the graphic for plain-paper vs. thermal printing are contingent. Sometimes plain-paper printing is more expensive, and it is arguable just how much paper is saved through initial electronic reception and whether more or less labor is expended in electronic vs. paper reception.

When economic-justification for a fax server exists, users can choose between two broad types of fax server products — modular or freestanding. Modular products consist of fax boards and client/server software or just client/server software that works with existing fax boards. Freestanding fax servers are self-contained units comprising fax boards and software that are attached to PCs or host computers, typically via an RS-232 link.

Fax boards in either type of product use a CCITT Group III fax modem and interface to one or more analog telephone lines.

Server software makes the fax boards accessible over local-area networks or makes fax boards appear as a network-attached printer. Server software also handles transmission queues and facsimile file management.

Client software enables workstations to send documents or graphics to the fax server, where the server software converts the file to Group III fax format and transmits it. Client software also enables workstation users to view, print or edit received faxes. Some client software even enables users to annotate a received fax and send it out again.

Most fax servers are geared for specific environments. Biscom, Inc. offers the widest range of enterprise fax servers that work with the greatest number of hosts. The company was the first to articulate an enterprise fax server strategy based on central or distributed fax servers linked to clients over wide areas via the Transmission Control Protocol/Internet Protocol.

A large number of modular fax servers are designed to run in Novell, Inc. NetWare environments. In fact, Cheyenne Software, Inc.'s FaxServe runs as a NetWare Loadable Module on NetWare servers in order to reduce hardware costs and exploit NetWare functions.

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Despite their benefits, end users have been slow to install fax servers. In fact, just 19,000 fax servers were sold last year, according to BIS Strategic Decisions, a market research company in Natick, Mass. In contrast, BIS reports that 1.8 million fax machines were sold last year. Still, the firm expects that 225,000 fax servers will be purchased by 1996.

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Types of fax servers

Modular products enable users to build several types of fax servers. This modularity makes it difficult to distinguish high-end fax servers from low-end ones because, for the most part, all users have to do in order to gain more capacity is add another fax board to the selected server platform.

To illustrate the point, a board-based fax server such as Optus Software, Inc.'s Facsys offers a low-end solution in a one-line implementation and a high-end solution in an eight-line installation.

Most freestanding units have limited scalability, yet IWI's Communique Fax Server supports between one and 504 lines. Meanwhile, JetFax, Inc.'s IIN offers richly featured client software, despite its low $795 price for the fax board and software.

However, some of the components used in modular products can be considered high-end units. Those that support multiple phone lines, multiple receive options and software tools for integrating facsimile capabilities into end-user applications are high end. In contrast, low-end components typically support a single phone line, are limited to a single receive option and may not support customizable application integration. So depending on what a user wants, it is easy to assemble a fax server that will meet those needs.

For instance, one or more facsimile boards and software can be added to a PC in order to form a computer-based fax server. About 40 vendors offer these kinds of boards and software, including such high-end leaders as Alcom Corp.'s 16-line LanFax Redirector and Intel Corp.'s eight-line NetSatisFAXtion, and such low-end leaders as SofNet, Inc.'s single-line FaxWorks LAN and Calculus, Inc.'s single-line E-Z Fax for Networks.

Likewise, fax servers can be interfaced to network printers, which can then receive and print faxes. Fax interface software for printers initially enabled laser printers to act as fax receivers. The concept has been extended with software that enables printer-linked fax servers to support fax-sending capabilities, thus eliminating the need for a PC to act as a dedicated fax server. Such printer-linked fax servers often appear more higher end than fax board-based systems due to higher prices, but this is usually only because fax board-based systems don't include the price of the PC platform and sometimes don't include the price of the fax boards, either.

Biscom pioneered the printer-linked fax server. Castelle's Faxpress combines facsimile and print server functions, while Octus, Inc.'s FaxConductor goes one step further, adding unified support for electronic mail messaging. IBM, through its recent alliance with CMA-Ettworth, is following a printer-linked fax server strategy for its Application System/400 minicomputer. Compaq Computer Corp. is integrating fax support directly into its network-ready PageMarq Fax printers.

Alternatively, users can employ fax server products to build an E-mail-to-fax gateway. Some E-mail vendors offer fax gateways that convert E-mail messages to Group III fax format. A few E-mail vendors offer proprietary fax servers, such as Lotus Development Corp.'s Lotus Notes Fax Gateway and Microsoft Corp.'s Microsoft Mail for AppleTalk Fax Gateway and Microsoft Mail for PC Networks Fax Gateway, but most fax server vendors build support for standard E-mail packages into their products. For instance, most fax server vendors support Novell's Message Handling Service (MHS) to convert E-mail messages to Group III fax format.

Lastly, components can be used to build fax machine-based servers. Here, a LAN adapter board and software is added to a fax machine that receives files from a client, converts them to Group III format and sends them. Typically, products in this category print received faxes, although nothing prevents them from routing incoming faxes over the LAN to the client.

Indeed, the fax machine-based Xerox Corp. 7033 LAN Fax Server offers manual and automatic inbound routing as well as printing at the fax machine. Other vendors participating in this category include fax machine makers Murata/Muratec and Toshiba International Corp., although independents such as AMA Computers, Inc., LA Business Systems, Inc. and Danville May Group, Inc. offer fax machine-based servers, too.

Fax machine-based servers can act as multifunctional devices, offering network scanning, copying and printing, as well as faxing. These units tend to be expensive and usually only support one phone line, which may limit their usefulness on large LANs.

Implementation strategies

Fax servers differ in price and performance, too, depending on how they are configured. A PC dedicated to the fax server function provides optimal performance, but the cost of the PC must be added to the cost of the fax server components. This can turn a $2,000 purchase into a $4,000 to $5,000 procurement and greatly

(continued on page 36)

Automatic inbound routing options emerge

The difficulties fax servers encounter in automatically routing incoming faxes to their intended receivers stems from a CCITT Group III facsimile shortcoming — the absence of standard subaddressing.

Without subaddressing, the only standard way to deliver a Group III fax directly to the intended receiver is to attach an incoming line to each workstation. The Consultative Committee on International Telephony and Telegraphy, which sets international facsimile standards, recognizes this fault and has a proposal under consideration to correct it.

The CCITT is proposing to use a modified handshake procedure. This will enable users to send subaddress routing information in the data packets that fax machines and fax servers use to establish a connection. If adopted as a standard, it could take as long as 10 years for modified handshaking to become universal because the standard is not backward compatible with the existing installed base of fax devices, meaning users will need to replace existing equipment in order to support the standard.

Some fax server vendors currently use their own modified handshaking procedure that requires senders to know the receiver's subaddress and how to enter it in the handshake procedure.

The drawback to a proprietary modified handshake is that it will only work when sending between a single vendor's fax equipment.

Fax server vendors offer other proprietary automatic inbound routing schemes. Among them is the use of dual-tone multifrequency (DTMF) extensions. With this method, the fax sender must dial the main fax number and the intended receiver's extension on a push-button phone, requiring the sender to know the receiver's extension.

There are a few drawbacks to this approach. For instance, most implementations require the fax server to answer the incoming call before the sender can enter the extension. A few vendors will play voice prompts, urging the sender to enter the extension.

Another approach is to use direct-inward dial (DID) numbers. With DID, each network user gets a personal seven-digit fax number. Telephone carriers maintain a list of DID numbers and route calls, as well as the dialed number, to the fax server over a receive-only phone line. The server deciphers the incoming DID number and automatically forwards faxes to the proper workstations.

The big advantage with DID is senders do not have to know anything more than the recipient's fax number. The big drawback is DID is costly. Each incoming DID line costs about $30 a month more than a regular phone line. In addition, users must pay an added 10 cents to several dollars per month for each DID number supported by that line.

Optical character recognition (OCR) can also be used to support automatic inbound routing. Senders place routing information such as an extension number or a name inside a special format, such as double brackets, on the fax cover sheet. Such information may look like this: [[B. Smith]].

The fax server uses OCR to read the routing information and checks it against a routing table. Then, it forwards the fax.

There are a few obstacles to OCR. The sender has to know the routing format, and OCR isn't very accurate at recognizing received fax text. Names are also often misspelled, defeating user-name routing tables.

Another approach is to use the Transmit Terminal Identifier (TTI), which is identification such as a company name or fax number that prints at the very top of a fax and identifies the sender. Some fax servers can read the TTI on incoming faxes and route all faxes with a particular TTI to a designated client. With only one TTI assigned per sender, it would be difficult to send a facsimile to more than one client node at the same location.

— *Peter Davidson*

The ins and outs of inbound routing

	Inbound routing options						
Feature	Manual routing	Automatic print	DTMF	DID	OCR	TTI	Proprietary handshake
Automatically routes fax to recipient workstation	-	-	✓	✓	✓	✓	✓
Works with any CCITT Group III fax system	✓	✓	✓	✓	✓	(1)	-
Works with delayed send	✓	✓	(2)	✓	✓	✓	✓
Sender must know and enter receiver's subaddress	-	-	✓	-	✓	-	✓
Works only with same brand or like-featured units	-	-	-	-	-	-	✓
Automatically routes to only 1 user on a LAN	NA	NA	-	-	-	✓	-
Supports on-screen viewing	✓	-	✓	✓	✓	✓	✓
Provides confidentiality	-	-	✓	✓	✓	✓	✓
Incurs extra training costs for senders	(3)	-	✓	-	✓	-	✓
Incurs extra fixed monthly phone service costs	-	-	-	✓	-	-	-
May delay fax delivery to recipient	✓	✓	-	-	-	-	-

(1) Works with any fax machine that can send a TTI, the identifier that is printed out at the top of a fax message.
(2) Some fax machines may support a delayed send with DTMF routing, depending on compatibility factors.
(3) Training required for fax server operator to manually route faxes.

DID = Direct-inward dial
DTMF = Dual-tone multifrequency (push-button phone commands)
NA = Not applicable
OCR = Optical character recognition
TTI = Transmit Terminal Identifier

SOURCE: DAVIDSON CONSULTING, BURBANK, CALIF

Fax servers

Company	Product	Product type	Network support						Platform C = Client S = Server								Software device support					Max. no. phone lines	Max. speed (K bit/sec)	Inbound routing					Price
		B = Board F = Freestanding M = Fax modem O = Other hardware S = Software	AppleTalk	LAN Manager	NETBIOS	NetWare	VINES	Other	DOS	IBM	Macintosh	OS/2	Unix	VAX	Windows	Other	Class 1 board	Class 2 board	Fax machine	GammaLink board	Intel board			Auto print	Manual route	Direct-inward dial	Dual-tone multifrequency	Modified handshake	
Alacrity Systems, Inc. (908) 813-2400	DDM Groupserver	B, S		✔	✔	✔		✔							C, S							1	9.6	✔	✔				$2,995
	E-Quip for Imaging	B, S						✔							C, S							1	9.6	✔	✔				$2,995
	Fax Server-In-A-Box	B, S		✔	✔	✔		✔							C, S							1	9.6	✔	✔				$1,495
Alcom Corp. (415) 694-7000	LanFax Redirector	S		✔	✔	✔	✔	✔	C, S						C, S	C				✔	✔	16	14.4	✔	✔	✔			$995-$9,995
ALLFAX, Inc. (313) 668-7859	FaxAll	B, S		✔	✔	✔	✔	✔	C, S			C, S		C	C	C						4	9.6	✔	✔		✔	✔	$3,495
AMA Computers, Inc. (416) 897-2153	SkyTek*Fax	B, S				✔			C, S						C, S		✔	✔	✔		✔	4	9.6	✔	✔	✔	✔		$699-$1,990
Arnet Corp. (615) 834-8000	ArnetFax	S						✔					C, S									8	9.6	✔					$695-$1,295
Biscom, Inc. (508) 670-5521	FaxCom 2001	F				✔	✔	✔	C	C	C	C	C	C	C	C, S						1	9.6	✔	✔				$4,995
	FaxCom 3000	F				✔	✔	✔	C	C	C	C	C	C	C	C, S						4	9.6	✔	✔	✔	✔		$7,995
	FaxCom 4000	F				✔	✔	✔	C	C	C	C	C	C	C	C, S						8	9.6	✔	✔	✔	✔		$15,995
	FaxCom 5000	F				✔	✔	✔	C	C	C	C	C	C	C	C, S						16	9.6	✔	✔	✔	✔		$24,980
The Bristol Group, Ltd. (415) 925-9250	IsoFax	B, S						✔	C	C	C		C, S		C			✔				24	14.4	✔	✔	✔			$2,585
Caere Corp. (408) 395-7000	FaxMaster Server	S		✔	✔	✔		✔	S						C						✔	1	14.4	✔	✔				$3,495-$4,395
Calculus, Inc. (305) 481-2334	E-Z Fax for Networks	B, S		✔	✔	✔	✔	✔	C, S						C							1	9.6	✔					$499
Castelle (408) 496-0474	Faxpress	F		✔		✔		✔	C		C	C			C							2	9.6	✔	✔	✔	✔		$2,995-$3,795
Cheyenne Software, Inc. (516) 484-5110	FaxServe	S				✔			C						C	S	✔				✔	(1)	9.6	✔	✔				$995
Circuit Research Corp. (603) 880-4000	FlexFax	S	✔								C, S											8	64	✔	✔		✔		$749-$4,999
CMA Ettworth (407) 352-5248	Telex/Fax/400	S						✔	C	C, S		C			C							56	9.6	✔	✔	✔	✔	✔	$2,500-$10,000
CommFORCE, L.C. (515) 224-0211	4-Sight Fax	B, S	✔								C, S											8	14.4	✔	✔				$2,995-$5,995
Compaq Computer Corp. (800) 345-1518	PageMarq Fax	B, S	✔			✔		✔	C		C				C	S						1	9.6	✔					$399
The Complete PC (408) 434-0145	Fax/Gateway	B, S						✔	C, S													1	9.6	✔	✔				$1,399
Computer Automation, Inc. (214) 680-9913	Q/Fax	B, S						✔	C		C			C, S	C							31	9.6	✔	✔	✔	✔		$6,400
Computers Unlimited (406) 248-1632	Fax for VAX	M, S						✔						C, S				✔				1	9.6	✔	✔				$995
Copia International, Ltd. (708) 682-8898	FaxFacts	B, S		✔	✔	✔	✔	✔	C, S		C		C		C, S					✔	✔	8	14.4	✔	✔	✔	✔		$800
Cracchiolo and Feder, Inc. (602) 327-1357	RightFax	B, S		✔		✔		✔	C, S			C, S			C					✔		16	9.6	✔	✔	✔	✔		$1,995
Cypress Research Corp. (408) 752-2700	FaxPro II	M, S	✔			✔					C, S											1	9.6	✔	✔				$850-$999
Danville May Group, Inc. (519) 846-8888	DMG/Fax	F						✔						C, S					✔			12	14.4	✔	✔	✔	✔		$6,000
DataFax Systems (612) 474-1500	FaxLink	F		✔		✔		✔	C, S	C, S		C, S	C, S	C, S							✔	4	9.6	✔					$4,145-$6,395
Data Processing Design, Inc. (714) 974-1515	Gold-Fax	S						✔	C		C			C, S	C							(1)	9.6	✔	✔	✔	✔	✔	$995-$1,495
DCE Corp. (203) 358-3940	FaxBox30/35/ 40/50/60	F		✔	✔	✔		✔	C	C	C	C	C	C	C	C						12	9.6	✔	✔	✔	✔		$2,495-$4,495
Devcom Mid-America, Inc. (708) 574-3600	TruFax	S						✔					C, S									20	9.6	✔	✔				$1,700-$5,000
Digital Equipment Corp. (508) 496-8321, (800) 344-4825	EC Fax Network Gateway	S						✔	C, S		C		S	C, S	C					✔		4	9.6	✔	✔				$3,995-$11,800
	Fax Mail	S						✔						C, S					✔			1	9.6	✔	✔				$3,000
Dove Computer Corp. (919) 763-7918	Fax LAN	B, S	✔			✔					C, S											1	9.6		✔				$609
Extended Systems, Inc. (208) 322-7575	FaxConnection 5900A	O, S				✔			C, S						C				✔			1	9.6	✔					$495
	FaxConnection 5019B	O, S				✔			C, S						C	C, S						1	9.6	✔					$945
	FaxConnection MFP	O, S				✔			C, S						C	C, S						1	9.6	✔	✔				$1,195
IBM (407) 352-5248, (800) 426-2255	Facsimile Support/400	S						✔		C, S		S										6	9.6	✔	✔				$898-$13,290
	Telex/Fax/400	S						✔	C	C, S		C			C							56	9.6	✔	✔	✔	✔	✔	$2,500-$10,000
IDR Unicom, Inc. (215) 825-8181	Via PC Faxserver	S		✔	✔	✔	✔	✔	C, S												✔	1	9.6	✔	✔			✔	$1,495
	Via LAN	S		✔	✔	✔			C, S								✔	✔			✔	1	9.6	✔	✔			✔	$995-$1,995
Intel Corp. (503) 629-7354, (800) 538-3373	LANSpool Fax	B, S				✔			C, S						C, S	C			✔		✔	1	14.4						$968-$1,098
	Net SatisFAXtion	B, S				✔			C, S						C						✔	8	14.4	✔	✔	✔	✔		$2,364-$2,494

Fax servers

Company	Product	Product type	Network support						Platform C = Client S = Server								Software device support					Max. no. phone lines	Max. speed (K bit/sec)	Inbound routing					Price
		B = Board F = Freestanding M = Fax modem O = Other hardware S = Software	AppleTalk	LAN Manager	NETBIOS	NetWare	VINES	Other	DOS	IBM	Macintosh	OS/2	Unix	VAX	Windows	Other	Class 1 board	Class 2 board	Fax machine	GammaLink board	Intel board			Auto print	Manual route	Direct-inward dial	Dual-tone multifrequency	Modified handshake	
IWI (408) 923-0301	Communique Fax Server	F				✔			C, S		C				C, S	C, S	✔			✔	✔	504	64	✔	✔	✔	✔		$5,345
JetFax, Inc. (415) 324-0600	IIN	O, S		✔	✔	✔		✔	C, S						C, S							1	9.6	✔					$795
	8000-D	O, S		✔	✔	✔		✔	C, S						C, S				✔			2	14.4	✔					$3,190
LA Business Systems, Inc. (708) 433-6477	Net-Send	S		✔		✔		✔	C, S		C				C, S	C, S			✔		✔	8	14.4	✔	✔		✔		$150
Lanier Worldwide, Inc. (404) 496-9500	Link	F	✔	✔		✔	✔	✔	C	C	C	C	C	C	C	C						4	9.6						$6,995-$28,995
Lotus Development Corp. (800) 343-5414	Lotus Notes Fax Gateway	S		✔	✔	✔	✔					C, S			C					✔		16	9.6		✔	✔			$2,500
Microsoft Corp. (206) 882-8080	Microsoft Mail for AppleTalk Fax Gateway	S	✔								C, S											(1)	14.4		✔				$795
	Microsoft Mail for PC Networks Fax Gateway	S		✔	✔	✔	✔		C, S		C	C			C					✔	✔	1	9.6	✔	✔				$1,995
Murata/Muratec (214) 403-3300	Facsimile Interface Processor	S				✔			C, S										✔			1	9.6	✔	✔				$200
Net+Effects (408) 997-1915	FaxLan	S		✔	✔	✔		✔	C, S						C		✔	✔			✔	8	9.6	✔	✔			✔	$195-$795
OAZ Communications, Inc. (510) 226-0171	NetFax Open	B, S				✔			C, S						C							4	9.6	✔	✔	✔	✔		$1,995
Octus, Inc. (619) 452-9400	FaxConductor	F				✔			C						C, S						✔	4	9.6	✔	✔				$4,195-$5,195
Optus Software, Inc. (908) 271-9568	Facsys	S				✔		✔	C, S						C, S		✔	✔		✔	✔	8	14.4	✔	✔	✔	✔		$995
Pacific Image Communications (818) 457-8880	Network SuperFax	B, S		✔	✔	✔			C, S			C, S			C, S		✔	✔				7	14.4	✔	✔				$549-$1,250
PureData, Inc. (214) 242-2040	PureFax	B, S		✔	✔	✔	✔		C, S						C, S						✔	1	9.6	✔	✔				$700
Samsung Software America Corp. (508) 685-7200	Replix	S						✔					S, C			C		✔				(1)	14.4	✔	✔				$2,395
Sepe, Inc. (714) 724-0806	Fax*Star	F						✔		C, S			C, S	C, S								4	9.6	✔	✔				$4,500
SofNet, Inc. (404) 984-8088	FaxWorks LAN	S		✔	✔	✔		✔	C, S			C, S			C, S		✔	✔			✔	1	14.4	✔	✔				$299
Solution Centers (916) 622-0630	Form FAX	S		✔		✔		✔	C, S						C, S					✔	✔	8	14.4	✔	✔				$3,495
STF Technologies, Inc. (816) 463-2021	FaxSTFnet	S	✔								C, S						✔	✔				1	14.4		✔				$249
Support Net, Inc. (800) 255-3390	Fax/401 Image	F						✔		C, S												1	9.6						$3,145-$8,115
Teubner & Associates, Inc. (800) 343-7070	FaxGate	F						✔	C, S	C		S			C					✔	✔	16	14.4	✔	✔				$7,880
TGI Technologies, Inc. (604) 872-6676	SciNet 2000	B, S				✔			C, S				C		C, S							8	9.6	✔	✔		✔		$625-$995
Toshiba International Corp. (714) 583-3000	ImageVision	S		✔		✔		✔							C, S				✔			1	14.4	✔	✔			✔	$499-$999
TransFax Corp. (310) 641-0439	Fax Management System	S				✔									C, S					✔	✔	16	14.4	✔	✔	✔		✔	$695-$5,595
Trio Information Systems, Inc. (919) 846-4990	DataFax	S		✔	✔	✔			C, S						C, S		✔	✔			✔	64	14.4	✔	✔				$595-$1,895
The Turbo Group (201) 662-8827	TurboFax	F	✔	✔		✔	✔	✔	C, S	C	C	C, S	C	C	C	C						12	14.4	✔	✔	✔	✔		$26,000-$50,000
Wilco Communications, Inc. (201) 612-9414	AutoFax	S	✔	✔		✔	✔	✔	C, S		C			C	C	C				✔		6	9.6	✔	✔	✔	✔		$4,000
Xerox Corp. (800) 832-6979	7033 LAN Fax Server	F				✔			C						C				✔			1	14.4	✔	✔		✔		$7,495
Zoom Telephonics, Inc. (817) 423-1072	Zoom/ FaxServer	B, S		✔	✔	✔	✔	✔	C, S						C, S							1	9.6	✔	✔				$299

FOOTNOTE:
(1) Software product; depends on hardware

SOURCE: DAVIDSON CONSULTING, BURBANK, CALIF.

(continued from page 33)

change the cost-justification picture. Having fax server functionality running along with end-user applications in a shared server can be economical but may compromise performance for both the fax server and the application. Freestanding servers may cost more but eliminate the need to buy a PC that would be used as a fax server platform.

Implementating a multiple line fax server has its benefits. For instance, one facsimile can be

The Short List:

Fax servers

This Short List highlights products we recommend you examine during the purchasing process for facsimile servers. Products included on The Short List meet the buying criteria we've outlined in the accompanying Buyer's Guide article and, in some cases, offer additional useful features. Those criteria reflect the needs of users with multivendor enterprise networks. Your criteria may differ based on network configuration and application needs.

Enterprise fax servers

- **Biscom, Inc.'s FaxCom 5000.** This freestanding fax server is among the most functional on the market. It can be used on Ethernet or token-ring local-area networks, including those running Banyan Systems, Inc.'s VINES, Novell, Inc.'s NetWare and the Transmission Control Protocol/Internet Protocol. It also supports a range of clients, including workstations based on DOS, Apple Computer, Inc.'s Macintosh, IBM's OS/2 and Microsoft Corp.'s Windows.

The FaxCom 5000 connects via an RS-232 link to a number of hosts, including Digital Equipment Corp. VAX, Hewlett-Packard Co. HP 3000 and IBM Application System/400 minicomputers, thus providing fax server functions to any client that can access those hosts. With as many as 16 telephone lines per server, it also supports two important inbound routing features, direct-inward dial (DID) and dual-tone multifrequency (DTMF).

The FaxCom 5000 costs $24,980.

- **ALLFAX, Inc.'s FaxAll.** A combination of software and fax board, this product runs on DOS- and OS/2-based servers. FaxAll provides enterprise fax server functions by supporting more network operating systems (NOS) than many of its competitors, including Microsoft's LAN Manager, VINES, NetWare, Artisoft, Inc.'s LANtastic and other Network Basic I/O System-based NOSes. It also works with VAX and AS/400 minicomputers.

Servers with as many as four phone lines each can use the firm's proprietary modified-handshake technology to send faxes between different networks. It also supports DTMF for inbound routing.

FaxAll costs $3,495.

NetWare fax servers

- **IWI's Communique Fax Server.** This freestanding product is on the edge of being an enterprise server. It is highly functional, supports a maximum of 504 phone lines but only works in NetWare environments. Furthermore, two Communique Fax Servers can exchange facsmiles over private network links at 64K bit/sec. Clients supported include DOS-, Macintosh- and Windows-based systems. The product also supports DID and DTMF inbound routing.

The single-line starting price is set at $5,345.

- **Alcom Corp.'s LanFax Redirector.** This DOS- or Windows-based software product supports up to 16 lines per server, DOS and Windows clients, and a top speed of 14.4K bit/sec. Besides supporting NetWare and a variety of other NOSes, it offers a strong set of software tools for integrating facsimile capability into applications. The tools include Intel Corp.'s Communicating Application Specification and Windows' Dynamic Link Libraries and Dynamic Data Exchange.

Additionally, it supports DID and DTMF inbound routing and allows remote configuration of clients and servers.

Pricing ranges from $995 to $9,995.

- **Optus Software, Inc.'s Facsys.** This DOS- or Windows-based software product supports eight lines per server at 14.4K bit/sec each.

A key feature is that it can be integrated with a broad selection of NetWare-compliant electronic mail products, including Novell's Message Handling Service (MHS)-based packages and Lotus Development Corp.'s cc:Mail. It also supports a mix of inbound routing options, including DID, DTMF and optical character recognition.

Facsys is priced at $995.

- **Cheyenne Software, Inc.'s FaxServe.** A DOS- or Windows-based product, FaxServe is the only fax server on the market that runs as a NetWare Loadable Module. This allows it to exploit such NetWare functions as security and management while obviating the need for a separate personal computer as the fax server platform.

The number of phone lines is limited by the number of slots available for fax boards in the NetWare server.

FaxServer costs $995. ◼

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in the transmission process and another can simultaneously be receiving. Likewise, a broadcast fax to multiple sites takes less time because all lines can be engaged in sending rather than a sequential broadcast over one line.

Although no hard-and-fast rules exist for determining the number of lines a typical user may need, Hugh Mackworth, vice president of marketing at Sunnyvale, Calif.-based GammaLink, Inc., says his rule of thumb is to provide one line for every 20 heavy fax users and one for every 100 light users. GammaLink pioneered computer facsimile and recently pulled its GammaNet product off the end-user market and will focus on selling it as an OEM to other fax server vendors.

For large LANs, users can install a single fax server with multiple phone lines to support all LAN segments or multiple single-line servers, each of which supports one segment. If multiple fax servers are installed, products that enable users to centrally manage all of them can be a time-saving blessing.

Send details

Examining the array of sending options a fax server supports is just as important as selecting a proper implementation strategy.

When fax servers first hit the market, they simply converted a mix of computer file formats such as ASCII text and graphics to Group III format. They still have that capability, but a growing number of fax servers are using modified print commands and printer-emulation software to convert files formatted to conform to certain printer languages to Group III format. For instance, a wide variety of fax servers will convert Hewlett-Packard Co. Printer Control Language (PCL) or Adobe Systems, Inc.'s PostScript files to Group III format.

But there is a word of caution about file format conversion. Users often do not realize that their faxes might look different when received than when they were created. ASCII files do not have fonts associated with the coded text. Thus, ASCII-converted documents are faxed in the font built into the fax board, not the fonts the document would have if coded under a word processing program and printed on a sophisticated printer.

However, modified print commands inherently support emulation of printer languages such as PCL. This means a sender's intended fonts can be preserved so that faxes received at remote sites are formatted as if they were printed at the local LAN printer.

With modified print command support in client software, users print an open file as a fax. Here, they simply select the fax device as the primary printer under the operating system or application software and then, when the print is executed, the file goes to the fax server instead of the printer.

Some fax server clients force users to reset primary printer settings from the fax server to the printer every time they switch from faxing to printing. Windows-based clients from Cracchiolo and Feder, Inc., Octus and Trio Information Systems, Inc. eliminate the need to switch from the fax server to the printer.

A growing number of fax server vendors are offering software tools that enable users to build fax capability directly into applications or E-mail clients. These tools make it possible for end users to execute a SEND fax command from the application menu.

In one of the more compelling aspects of fax servers, these integration tools include application program interfaces (API) that build fax capability into user-developed strategic applications. For instance, a telemarketing agent can have push-button access to customer-support documents stored on the fax server and then instantly fax a document to help close a sale or minimize the cost of providing customer service.

Many proprietary APIs — several aspiring to be standards — and an assortment of application integration tools such as Windows' Dynamic Data Exchange coexist today. And some buyers are delaying purchases, worrying that a new standard will make ex-

(continued on page 38)

Fax server return on investment

Fax server benefit	Onetime savings	Savings based on 10,000 pages per year	Savings based on 50,000 pages per year
Print-received faxes on plain paper instead of thermal (1)		$200	$1,000
View-received faxes on-screen rather than print (2)		$100	$500
Eliminate need to print document before sending (2)		$100	$500
Send 50% of all domestic faxes at night (3)		$200	$1,000
Send 50% of all international faxes at night (4)		$2,000	$10,000
Eliminate purchase of plain-paper fax machine	$1,500-$3,500		
Eliminate labor cost for delivering hard-copy faxes to desktop (5)		$660	$3,300
Eliminate labor cost for sending faxes via fax machine (6)		$2,000	$10,000

(1) Based on plain-paper cost of 1 cent per page vs. thermal paper cost of 3 cents per page.
(2) Based on paper cost of 1 cent per page.
(3) Assumes 2 pages sent per minute and discounted phone rate of 8 cents per minute.
(4) Assumes 2 pages sent per minute and discounted phone rate of 80 cents per minute.
(5) Based on electronically routing 80% of incoming faxes and assuming a $10-per-hour worker is paid 33 cents for the 2 minutes it takes to deliver an average 4-page fax.
(6) Based on sending 80% of all faxes from computer and assuming a $10-per-hour worker is paid $1 for the 6 minutes it takes to send an average 4-page fax.

Note: Savings do not apply in all cases. Actual savings may vary.

SOURCE: DAVIDSON CONSULTING, BURBANK, CALIF.

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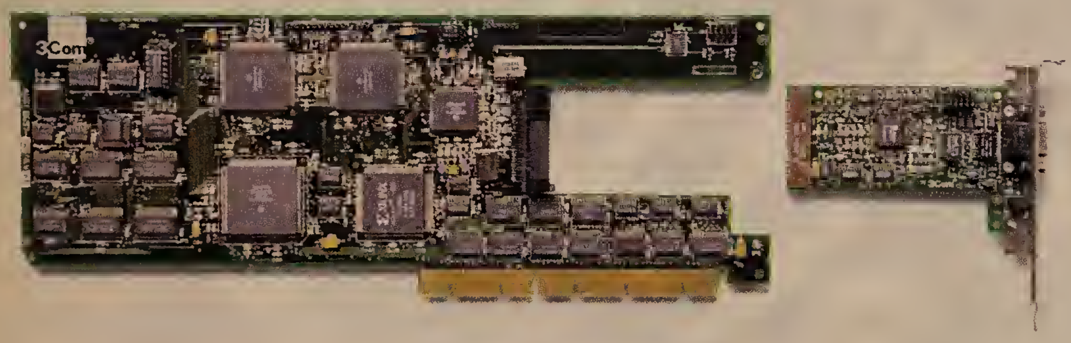
DI revolution.



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(continued from page 37)

isting APIs — and, therefore, the applications they support — obsolete.

However, that is unlikely to develop into a major issue for several reasons: A truly standard API may not emerge at all; any standard API will probably provide least common denominator capabilities, forcing users to adopt proprietary APIs to gain more robust capabilities; and vendors are preparing to adopt multiple APIs to maintain backward-compatibility with their installed bases and forward-compatibility with emerging standards.

On the server side of the equation, fax server software queues files received by clients until they can be sent. The server software also typically provides such added functionality as automatic redialing of busy fax numbers, broadcasting and the electronic delivery of send confirmation or error reports to client workstations.

The broadcast capability can be helpful for firms that make sizable, time-sensitive broadcasts, such as DIC Enterprises, Inc., a maker of television cartoons. The firm's Castelle Faxpress has "been a godsend for the publicity department," says Seth Levinson, the company's MIS vice president. "Our press release broadcasts, which are really huge, used to require the printout of hundreds of separate cover sheets and took a person two days to complete. Now it's automated. Just push a button and it takes only a couple of hours."

Indeed, many fax servers enable users to store common fax cover sheets and frequently used documents in the server. Some fax servers, such as those made by Alacrity Systems, Inc. include a scanner that enables users to mix files stored on the fax server with scanned-in pages in the same multipage facsimile. Others, such as Alcom's LanFax Redirector, use a prerasterized document library to support quick faxing, in which a user simply types in the name of the document to be faxed.

The inbound routing bugaboo

The big controversy in the fax server market is over inbound routing. The root of the problem is that Group III fax doesn't yet support a subaddressing standard, although CCITT is working on one. Without standard subaddressing, no universal way exists to automatically route facsimiles past a fax server and directly to the intended receiving workstation.

All is not lost, however. Just about every fax server vendor offers two main inbound routing options. All incoming faxes can be automatically routed to a LAN printer or stored at the fax server until a human operator can view them and manually address them to clients.

For many users, inbound routing is a moot point. They'd rather have faxes automatically printed on a network printer or received on a fax machine and manually distributed to the receiver. Printer-linked fax server vendors such as Castelle and JetFax have championed this alternative as an easy and economical way to implement network facsimile. However, Castelle does offer some automatic inbound routing options, too.

For those that do not want to print incoming faxes, a manual inbound routing option is still viable. But even here there are some problems. The operator who views incoming faxes and redirects them to the intended receiver is likely the LAN administrator, who probably isn't going to appreciate the constant interruptions. Furthermore, it could take longer than needed to deliver faxes if the operator is busy.

This approach also lacks confidentiality. Even in those fax servers that only let operators see the cover page — which is the first page received — they may see sensitive information. Even still, if the operator were interested enough in what is seen on the first page, all that person has to do is print out a copy of the whole fax and simply claim it was unroutable.

Alcom took manual routing a major step forward at NetWorld 92 Dallas with the introduction of QuickRouter. This Windows-based software causes the image of the first page received to automatically pop up in one window on a PC while a user list pops up in a second. The operator can read the addressee's name, match it to a name on the user list and click on a mouse to activate the routing. It doesn't presume to provide confidentiality but involves several fewer steps than other manual routing solutions and can be used by lower paid operators.

Inbound routing may also create hidden burdens because network managers must maintain end-user routing tables, updating them every time an employee is added or moved. They must also conduct file maintenance, a burden that emerges as memory-gobbling image files collect in fax mailboxes.

Lastly, routing faxes means that bit-intensive image files eventually move across the network from the fax server to user workstations or printers, potentially slowing overall network response time. Printing faxes at a fax server-attached printer or

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fax machine-based facsimile server eliminates image traffic from the network. Users should keep in mind that outbound faxes are sent to the fax server as native files and converted to Group III images at the server, thus keeping bandwidth needs to a minimum.

Other factors

Fax-server vendors are rapidly minimizing the burden of installation and making their products more LAN administrator-friendly. In the NetWare-compatible segment of the market, the latest products from Castelle, Intel, Optus and others work with a NetWare bindery, a directory in which LAN user names and data are stored. The ability to tap into NetWare bindery data automates the process of registering user names and their privileges in the fax server software.

Furthermore, Castelle's fax server automatically registers new LAN users when they first log on. Intel recently added a capability to set up client software from a central workstation, rather than physically installing software at every client. Most fax servers allow facsimile phone numbers to be imported into a central fax phone number directory from existing databases.

For ongoing management, most products offer reports detailing system utilization, and many allow for chargeback of fax calling costs to clients or departments.

When it comes to forking out money for a fax server, buyers are forced to do their homework on pricing because the industry follows multiple pricing policies and hidden costs may exist for such things as buying a PC to act as a fax server or for facsimile devices, such as fax boards, that are not bundled into the product. Other extra-cost items may include specific file format converters and certain automatic inbound routing options. Some vendors have software-only pricing, some bundle their software with hardware, and some prices are based on user licenses.

At the high end, software and fax board-based products typically average $1,500 to $2,500 per line. However, low-end software and fax boards supporting a single line start at about $300.

Many happy returns

Despite the receive side drawbacks, many users have found fax servers helpful. At the Minneapolis-based law firm of Bowman & Brooke, too many legal secretaries were spending too much time in line at the firm's one fax machine. Installing a GammaLink GammaNet fax server and using it just to send faxes broke the bottleneck.

At Software Publishing Corp., a major software vendor in Santa Clara, Calif., the technical support people were weary of facsimile machine lines and only faxed support information to customers as a last resort. "We knew the quality of our communications could be better with fax support," says Andy Burnett, support development engineer at the firm. "Using fax can help close a call."

The firm now uses Alcom's LanFax Redirector and an associated database of technical support documents to enable staff to send more faxes in less time, saving money and improving customer service.

By using a fax server, Software Publishing trims an average of six minutes off the typical fax transmission time. By keeping $10-an-hour customer support personnel out of fax lines, Burnett figures his company now saves $1 for every fax sent.

A Castelle FaxPress fax server at Oregon State University gives faculty members, who often work after-hours when fax machines in restricted areas are unavailable, 24-hour access to fax service. They can even access the fax server when working at home via E-mail.

The bottom line

In terms of discerning the suitability of fax servers for an application, department or enterprise, network managers must determine whether enough fax traffic is initially computer-based and whether it is as easily accessible as computer files when faxing occurs.

The bottom line is that fax servers are largely justified on the basis of their automation of the sending process. They don't need to replace fax machines lock, stock and barrel when sending, or provide a wholly electronic receive capability at the client workstation. They can earn their keep merely by complementing existing paper-based fax systems.

Thus, users must face the essential quandary in the fax server market today. While they are given pause by thorny receive-side issues, they can gain major benefits by exploiting send-side ones. ◻

Davidson is president of Davidson Consulting of Burbank, Calif., which publishes a fax server Buyer's Guide and NetFax News, *a fax server newsletter. He can be reached at (818) 842-5117 or by fax at (818) 842-5488.*

Features Managing Editor Jim Brown contributed to this story.

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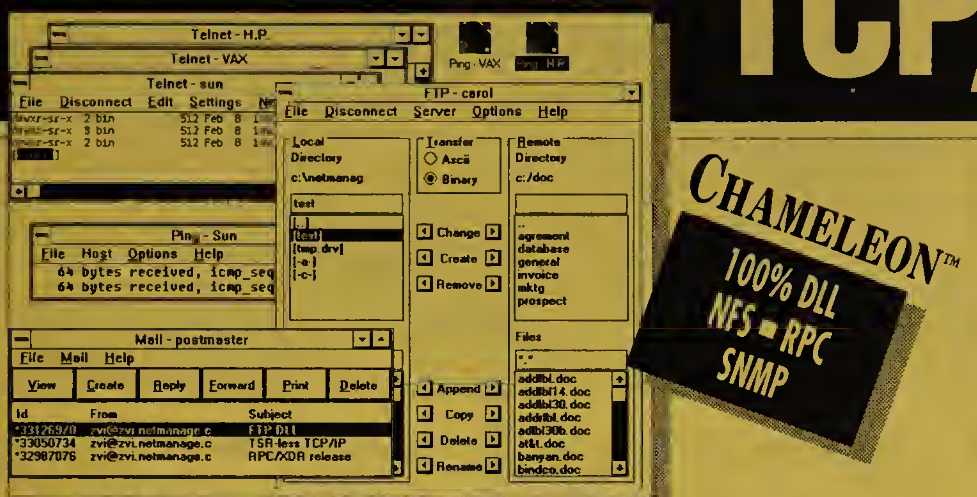

```
drwxr-sr-x  2 bin      512 Feb  8
drwxr-sr-x  3 bin      512 Feb  8
drwxr-sr-x  2 bin      512 Feb  8
```

```
64 bytes received, icmp_seq
64 bytes received, icmp_seq
```

test: [..] [test] [tmp.drv] [-a-] [-c-]

.. agreement database general invoice mktg prospect

. addlbl.doc addlbl14.doc addlbl30.doc addrlbl.doc adlbl30b.doc at&t.doc banyan.doc bindco.doc

Id	From	Subject
*33126970	zvi@zvi.netmanage.c	FTP DLL
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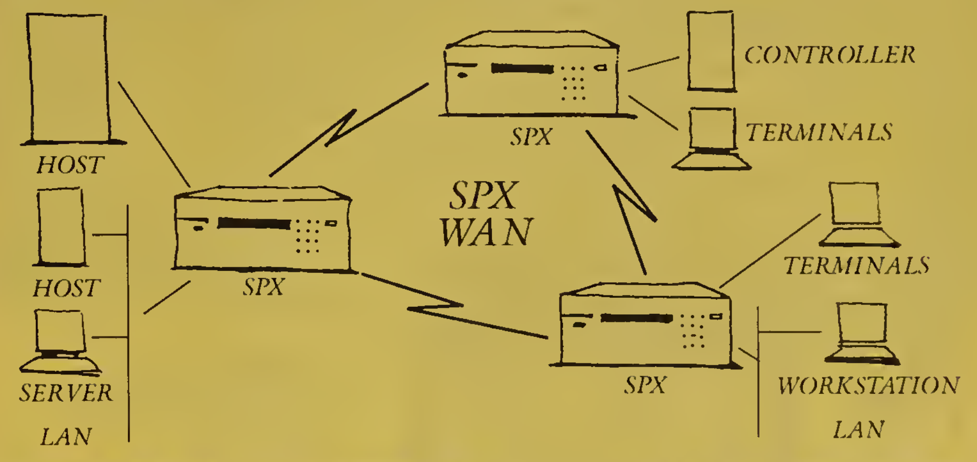

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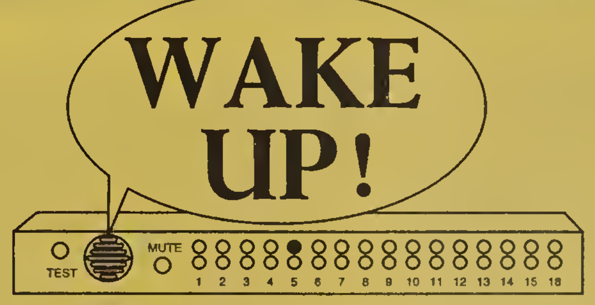

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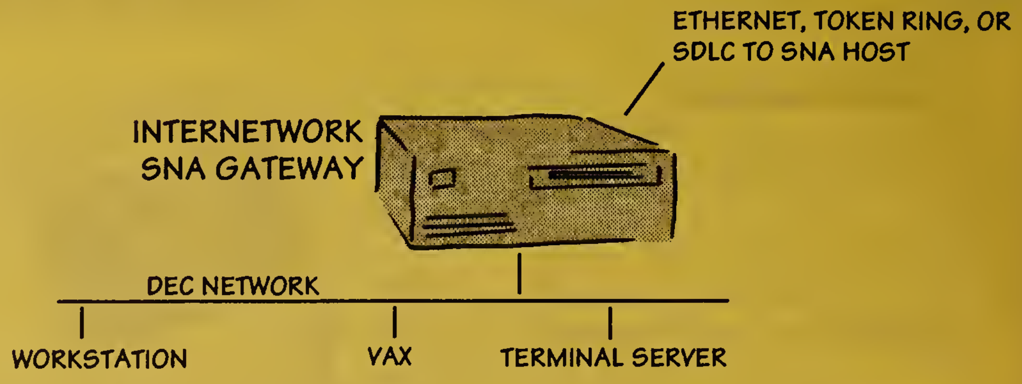

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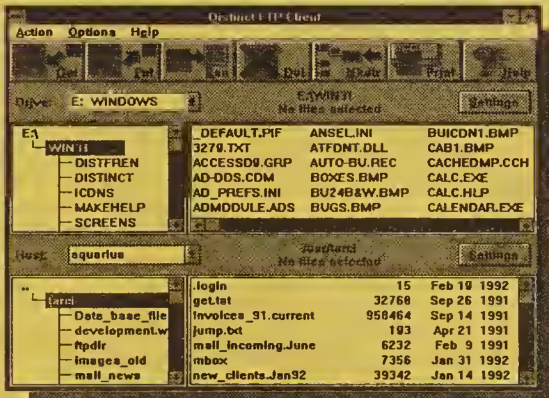

```
Drive: E: WINDOWS        E:\WIN31
                         No files selected
E:\
 └WIN31      _DEFAULT.PIF    ANSEL.INI      BUICDN1.BMP
   ├DISTFREN 3270.TXT        ATFDNT.DLL     CAB1.BMP
   ├DISTINCT ACCESSD9.GRP    AUTO-BU.REC    CACHEDMP.CCH
   ├ICONS    AD-DDS.CDM      BOXES.BMP      CALC.EXE
   ├MAKEHELP AD_PREFS.INI    BU24B&W.BMP    CALC.HLP
   └SCREENS  ADMDDULE.ADS    BUGS.BMP       CALENDAR.EXE

Host: squarius           /usr/card
                         No files selected
..
 └carci            .login                   15  Feb 19 1992
   ├Data_base_file get.tst               32768  Sep 26 1991
   ├development.w  invoices_91.current  958464  Sep 14 1991
   ├ftpdir         jump.txt                193  Apr 21 1991
   ├images_old     mail_incoming.June     6232  Feb  9 1991
   └mail_news      mbox                   7356  Jan 31 1992
                   new_clients.Jan92     39342  Jan 14 1992
```

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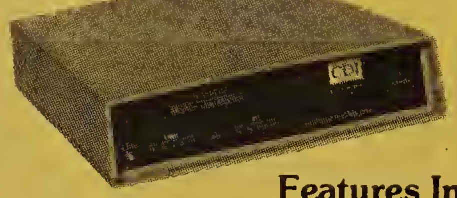

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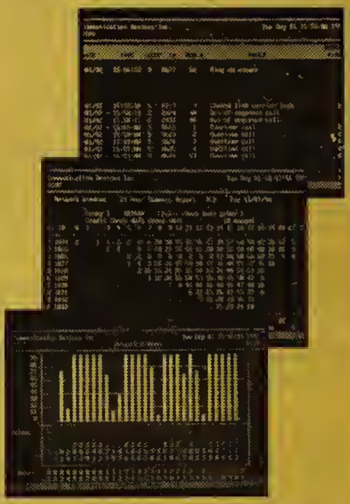

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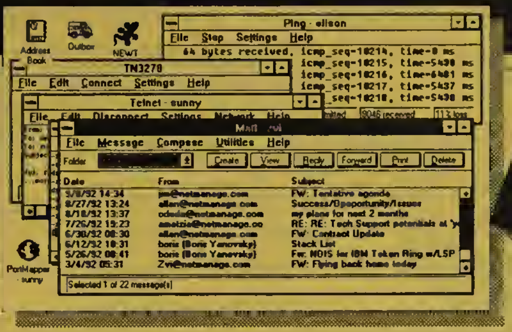
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Ping - ellson
File Step Settings Help
TN3270
File Edit Connect Settings Help
Telnet - sunny
File Edit Disconnect Settings Network Help
Mail
File Message Compose Utilities Help
Folder
Create View Reply Forward Print Delete

```
64 bytes received, icmp_seq=10214, time=0 ms
                   icmp_seq=10215, time=5430 ms
                   icmp_seq=10216, time=6401 ms
                   icmp_seq=10217, time=5437 ms
                   icmp_seq=10218, time=5430 ms
```

Date	From	Subject
9/8/92 14:34	[illegible]@netmanage.com	FW: Tentative agenda
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8/18/92 13:37	[illegible]@netmanage.com	my plans for next 2 months
7/26/92 15:23	[illegible]@netmanage.co	RE: RE: Tech Support potentials at [illegible]
6/30/92 08:30	allen@netmanage.com	FW: Contact Update
6/12/92 10:31	boris (Boris Yanovsky)	Stack List
5/26/92 08:41	boris (Boris Yanovsky)	Fw: NDIS for IBM Token Ring w/LSP
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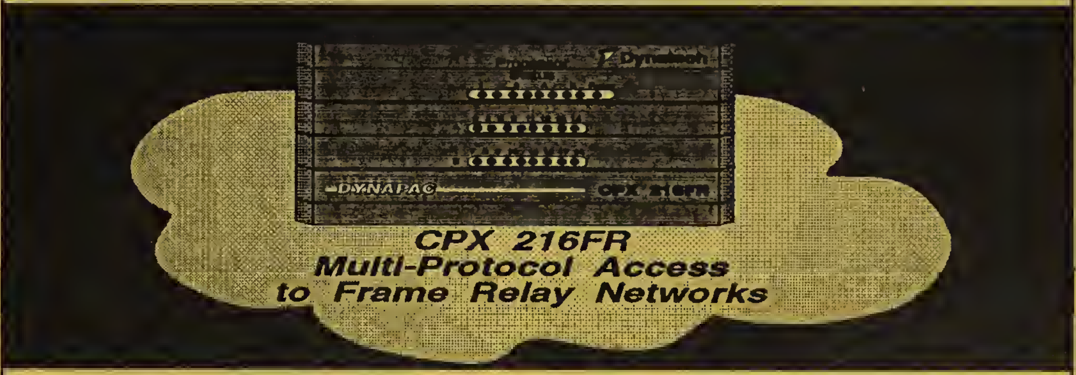

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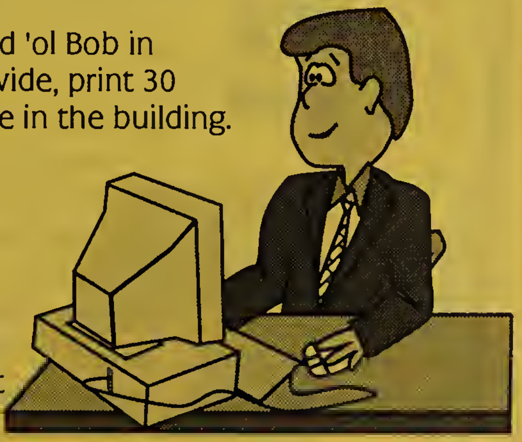

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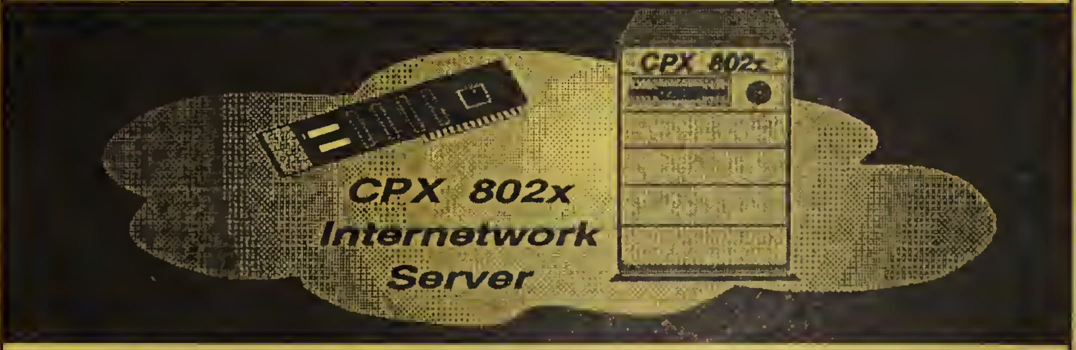

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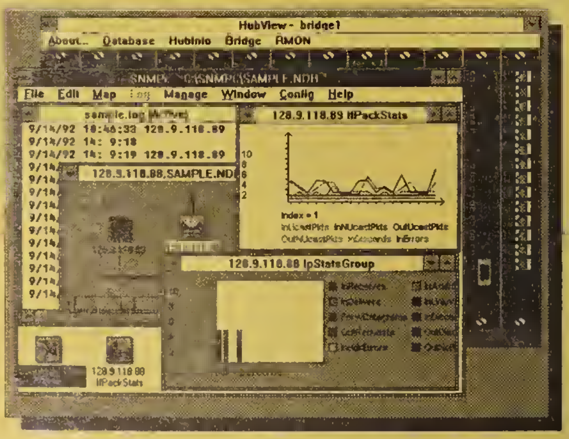
HubView - bridge1
About... Database HubInfo Bridge RMON
SNMPc C:\SNMPC\SAMPLE.NDB
File Edit Map Log Manage Window Config Help
sample.log
128.9.118.88,SAMPLE.NDB
128.9.118.89 IfPackStats
Index = 1
InUcastPkts InNUcastPkts OutUcastPkts
OutNUcastPkts InDiscards InErrors
128.9.118.88 IpStatsGroup
128.9.118.88 IfPackStats

9/14/92 10:46:33 128.9.118.89
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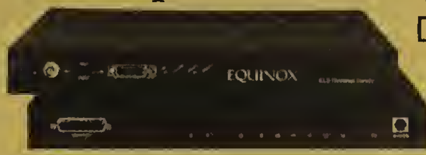

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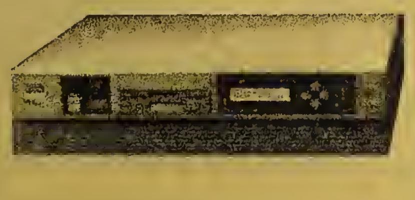

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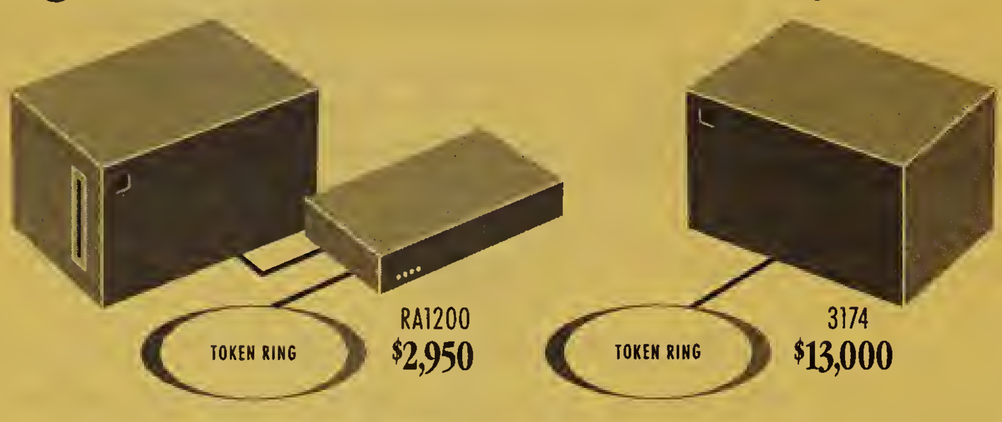

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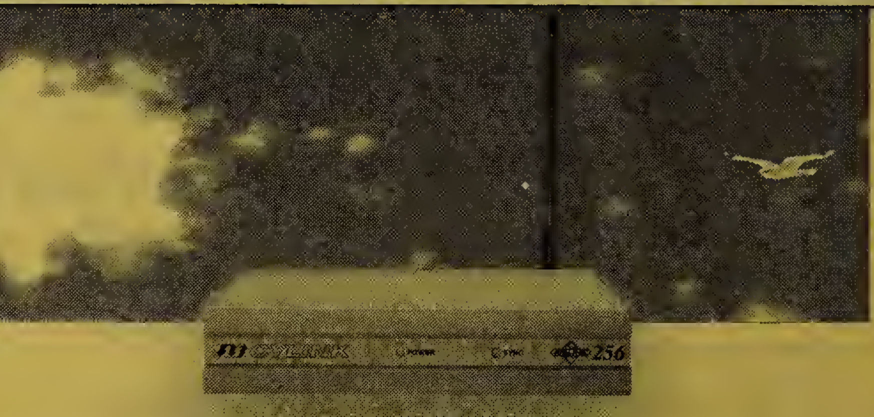

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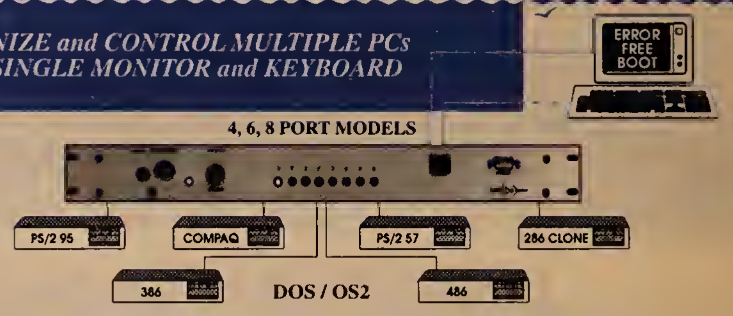

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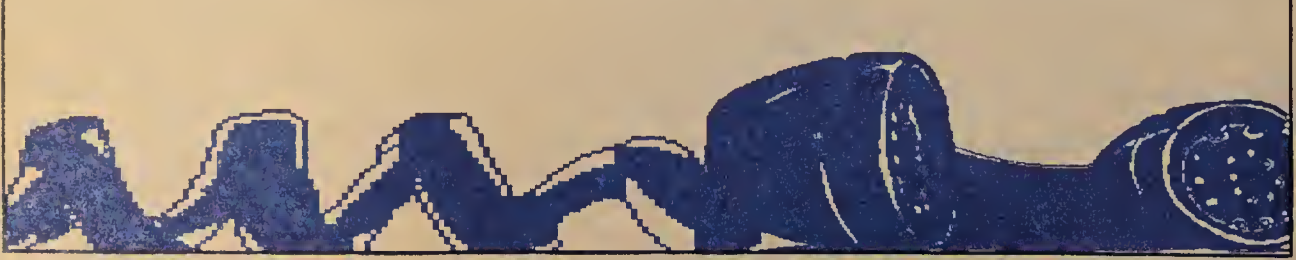

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IBM preps 32-bit version of OS/2

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Data Communications Services/2 (DDCS/2), the database connectivity software it announced six months ago. IBM is also scheduled next week to make an announcement concerning the RISC System/6000, and sources said IBM will announce it is porting OS/2 Database Manager to the AIX operating system.

The DDCS/2 works in conjunction with OS/2 Database Manager to provide a direct LU 6.2 link to DB2, eliminating the need for special CICS software acting as an intermediary between the two databases. IBM is also expected to make enhancements to this product in the area of better connectivity between Database Manager and DB2.

"With this product, IBM finally has a seamless link from the OS/2 Database Manager to DB2," explained Richard Finkelstein, president of Performance Computing, Inc., a consultancy in Chicago.

Sources close to the company said the announcements would result in better SQL query handling between the OS/2 Database Manager and DB2.

In addition, analysts said the new 32-bit version of Database Manager may help IBM boost demand for OS/2, which is going head-to-head with Microsoft Corp.'s Windows NT. Windows NT and Novell, Inc.'s NetWare and UnixWare, as well as Unix, all support or will support 32-bit database offerings, they said.

In benchmarks against 32-bit products, 16-bit versions of database products running on OS/2 have suffered from a 16M-byte random-access memory constraint, slower I/O performance and the inability to handle heavy transaction loads.

"IBM's future in the PC arena rests on OS/2," Finkelstein said. "If they can't sell OS/2 as a server platform, the client side of OS/2 will be finished."

IBM declined to comment on the announcements, but analysts agreed they should give IBM a boost in client/server. "Client/server is growing, and IBM doesn't want to be left behind," said Shaku Atre, president of Atre, Inc., a database consultancy in Rye, N.Y. "These announcements should help them there." ◻

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Penril fills in gaps in product lines

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Equipment Corp. Spanning Tree Protocols, as well as the Point-to-Point Protocol, X.25 and frame relay. Serial interfaces include RS-530, RS-232 and V.35 at up to 256K bit/sec.

The 1710 offers a filtering and forwarding rate of 14,880 packet/sec. Available next month, the 1710 costs $5,795.

Penril also will roll out the DX144, a V.32bis modem that allows personal computers or hosts to send and receive fax messages, eliminating the need for a fax machine. It will be available next month for $595. A managed version is expected by midyear.

Finally, the company is expected to announce a new data compression feature for its Series 1220 remote Ethernet bridges. The device will support compression rates as high as 6-to-1. Bridges will ship with the new capability in February. Pricing ranges from $4,295 to $5,595. Existing 1220s can be upgraded in the field for $1,095. ◻

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Infonet joins Microsoft in mgmt.

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combine Microsoft's Hermes management technology with Infonet's own technology — will enable Infonet to offer an end-to-end management service that encompasses customers' local-area network servers and attached desktop devices.

"With the new technology, Infonet will be able to see the line, the router, the customer's LAN server and all the way out to the network interface card in LAN-attached devices," one source said privately.

This is particularly important since InfoLAN is a worldwide service, meaning anything the company can do to reduce the need for LAN troubleshooters at overseas sites can translate into savings for customers. Today, the company's management responsibility ends at the routers that customers use to access InfoLAN.

The technology will also add a whole new system management dimension to the company's management service.

Besides indicating the status of network equipment, it will make it possible for Infonet to provide inventory management down to the desktop, offer performance and configuration management, and determine how much memory is available at the desktop, as well as what generations of software are installed and what drivers and video cards are being used. Software distribution will also be supported.

The deal is "pretty strategic for Infonet," said Roberta Wiggins, a senior analyst at The Yankee Group, a Boston-based research firm. "Now they can offer customers a solution that extends right down to the desktop level."

The new encryption service for InfoLAN should also add strategic value. The service will be offered using Semaphore Communications Corp.'s new Network Security System technology. Infonet will handle worldwide installation of security systems, configuration and maintenance, as well as monitor security violations and change security codes.

Single-vendor solution

Unlike competing encryption services from other X.25 packet-switched networks, which are farmed out to third parties, InfoLAN's approach is a single-vendor solution, with global management, end-to-end support and a single point of accountability, Infonet said.

Infonet plans to roll out the data encryption service in North America in the third quarter of this year and throughout the world slightly later. Pricing will depend on the number and locations of sites supported.

According to Infonet, the encryption service will appeal primarily to the 20% of its clients in the finance, high-technology and pharmaceutical industries who want to protect sensitive financial information, chip designs and drug formulas. ◼

Chipcom lays out its 1993 blueprint

continued from page 2

The company currently offers per-port configuration switching that allows a user to logically move a device from one local-area network in the ONline to another.

As a result of the partnership with a switched Ethernet vendor, Chipcom will offer users a Reduced Instruction Set Computing-based multiport switching module that will provide dedicated 10M bit/sec links to the desktop. The product is expected to ship by midyear.

Fowler said the company will work closely with leading bridge/router vendors to add high-performance routing to its current line of bridge/router modules.

The next step is to provide Asynchronous Transfer Mode (ATM) cell relay functionality within the hub. "After creating these dedicated Ethernet LANs, the next problem involves interconnecting them, which requires a high-speed pipe," Fowler said. "That pipe is ATM."

He stressed that this addition would not alter the existing TriChannel architecture of the ONline, but instead enhance it. "We will extend the ONline hub to get higher performance backplane connectivity by slicing up our TriChannel and establishing a high-speed ATM channel."

The company will position this new channel as a high-speed backbone, which is expected to be available by year end. ATM-to-the-desktop capabilities will be offered during 1994.

Chipcom will also continue to upgrade it management capabilities. It plans to introduce a feature, dubbed Pathfinder, for its ONdemand Network Control System net management package that will automatically track device changes.

Later this year, Chipcom plans to port its ONdemand package to Hewlett-Packard Co. OpenView and Digital Equipment Corp.'s Polycenter Ultrix-based platform. ◼

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